



**A Draft Report on Progress with
Implementation of the New South Wales
Regional Forest Agreements (RFAs)
North East RFA, Eden RFA, Southern RFA**

**A report providing information to enable public
representations on the implementation of the RFAs**

May 2009



Australian Government



**New South Wales
Government**

INFORMATION



Australian Government



New South Wales Government

This report has been coordinated by Resource and Conservation Unit of the Department of Environment and Climate Change NSW.

For more information contact:

Resource and Conservation Unit, Department of Environment and Climate Change NSW

Email: info_racu@environment.nsw.gov.au

© Copyright State of NSW and Commonwealth of Australia 2009

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Department of Environment and Climate Change NSW and the Commonwealth. Requests and inquiries concerning reproduction and rights should be addressed to the Manager Publishing, Department of Environment and Climate Change NSW, 59-61 Goulburn Street, PO Box A290, Sydney NSW 1232 and the Commonwealth Copyright Administration, Attorney General's Department, Robert Garran Offices, National Circuit, Barton ACT 2600 or posted at www.ag.gov.au/cca

Preferred way to cite this publication: *A Draft Report on Progress with Implementation of the New South Wales Regional Forest Agreements*. A report prepared by the NSW Minister for Climate Change and the Environment and the Australian Government Minister for Agriculture, Fisheries and Forestry as part of the implementation of the NSW Regional Forest Agreements. Resource and Conservation Unit, NSW Department of Environment and Climate Change NSW, Sydney.

Published by:

Department of Environment and Climate Change NSW on behalf of the State of NSW and the Commonwealth of Australia

59-61 Goulburn Street, Sydney

PO Box A290

Sydney South, NSW 1232

Phone: (02) 9995 5000 (switchboard)

Phone: 131 555 (environment information and publications requests)

Phone: 1300 361 967 (national parks information and publications requests)

Fax: (02) 9995 5999

TTY: (02) 9211 4723

Email: info@environment.nsw.gov.au

Website address: www.environment.nsw.gov.au

ISBN 978-1-74232-177-6

DECC 2009/200

May 2009

Printed on paper made from sustainable forest plantations

Key contributors:

- Department of Environment and Climate Change NSW (Parks and Wildlife Division)
- NSW Department of Primary Industries (Forests NSW and Fisheries)
- Australian Government (Department of Agriculture, Fisheries and Forestry)
- Australian Government (Department of the Environment, Water, Heritage and the Arts)

Disclaimer

While every reasonable effort has been made to ensure that this document is correct at the time of printing, the State of NSW and the Commonwealth of Australia, its agents and employees, do not assume any responsibility and shall have no liability, consequential or otherwise, of any kind, arising from the use of or reliance on any of the information contained in this document.

A Draft Report on Progress with Implementation of the New South Wales Regional Forest Agreements (RFAs)

North East RFA, Eden RFA, Southern RFA

A report providing information to enable public
representations on the implementation of the RFAs

May 2009



Australian Government



**New South Wales
Government**

Contents

Acronyms and abbreviations	X
1. Executive summary	1
1.1. Background	1
1.2. Purpose of the review.....	4
1.3. Post-RFA changes to the forest management system and additional reserves	4
1.4. Key progress of milestones	5
1.5. Results of monitoring – criteria and indicators	8
2. Background information on the agreement and its review, including milestones	11
2.1. Introduction.....	11
2.2. Commitments over the life of the RFAs	12
2.3. Requirements for five-yearly reviews	12
2.4. Principles for conduct of the review	12
2.5. Items for the review and limitations.....	13
2.6. Linkages to other processes	13
2.7. Roles and responsibilities.....	13
3. Post-RFA changes to the forest management system and additional reserves...15	
3.1. Legislative changes.....	15
3.2. Departmental names	17
3.3. Reserve categories	18
3.4. Additional areas.....	19
3.5. Montreal Implementation Group (MIG) indicators.....	20
4. Review of milestones	22
4.1. Review process	22
4.2. Process for reviewing and extending the RFAs	22
4.3. RFA reporting and tabling requirements	25
4.4. NSW Forest Agreements and IFOAs – including reporting	29
4.5. Regional development initiatives.....	32
4.6. Research and data management.....	32
4.7. Reserve management.....	37
4.8. CAR reserve system	42
4.9. Threatened species management.....	43
4.10. Cultural heritage values.....	46
4.11. Environmental management systems	48
4.12. Integrated control programs for bushfires, feral animals and weeds	52
4.13. Audit, review and reporting processes	59
4.14. Forest management systems on public and private lands.....	68
4.15. Management by Forests NSW	70
4.16. Inventory of private forests	74

4.17.	Competition principles agreement.....	75
4.18.	Timber supply supplementation	77
4.19.	FRAMES tool, not including sustainable yield and volume review	79
4.20.	Sustainable yield and wood supply strategy	90
4.21.	Volume review.....	94
4.22.	Contract volumes and long-term wood supply contracts	96
4.23.	Production of timber products	96
4.24.	Model to predict recruitment and maintenance of habitat trees	97
5.	The results of monitoring of sustainability indicators.....	98
5.1.	Background	98
5.2.	Criterion 1: Biodiversity	99
5.3.	Criterion 2: Productive capacity of forest ecosystems	116
5.4.	Criterion 3: Ecosystem health and vitality	130
5.5.	Criterion 4: Soil and water resources	147
5.6.	Criterion 5: Maintaining the forest global carbon pool.....	150
5.7.	Criterion 6: Socio-economic benefits	153
5.8.	Criterion 7: Legal, institutional and economic frameworks.....	160
	Bibliography.....	178
	Appendix 1: Items for the review and review conclusion	184
	Appendix 2: Management plans	193
	Appendix 3: Recovery plans	204
	Appendix 4: Timber volumes and allowable cut.....	225
	Appendix 5: List of forest-dwelling species	229
	Appendix 6: Threatened species listing	233
	Appendix 7: Forest management zoning.....	247
	Appendix 8: Timber volumes by grade	249
	Appendix 9: Non-timber forest products	256
	Appendix 10: Area and percentage of plantation established meeting effective stocking	260

Acronyms and abbreviations

ABLR Act	<i>Aboriginal Land Rights Act 1983</i>
AHC Act	<i>Australian Heritage Council Act 2003 (Cwth)</i>
API	aerial photograph interpretation
BMAD	bell miner associated dieback
CL Act	<i>Crown Lands Act 1989</i>
CMA	catchment management authority
CRA	Comprehensive Regional Assessment
CRAFTI	Comprehensive Regional Assessment aerial photo interpretation
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Australian Government (Department of Agriculture, Fisheries and Forestry)
DEC	Department of Environment and Conservation
DECC PWG	Department of Environment and Climate Change (Parks and Wildlife Group)
DECC	Department of Environment and Climate Change NSW
DEWHA	Department of the Environment, Water, Heritage and the Arts
DIPNR	Department of Infrastructure, Planning and Natural Resources
DLWC	Department of Land and Water Conservation
DNR	Department of Natural Resources
DPI	Department of Primary Industries
EFT	equivalent full-time
EMS	environmental management system
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environment Protection Authority
EPL	environment protection licence
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
EPRD	Environment Protection and Regulation Division (part of the Department of Environment and Conservation)
ESFM	ecologically sustainable forest management
FA	Forest Agreement (Agreements between NSW Ministers)
FM Act	<i>Fisheries Management Act 1994</i>
FNPE Act	<i>Forestry and National Park Estate Act 1998</i>
FNSW	Forests NSW
FPF	Financial Policy Framework
FRAMES	Forest Resource Assessment and Management Evaluation System
FRIP	Forestry and Rural Industry Policy
GIS	geographic information system
IFOA	integrated forestry operations approval

ISO	International Organisation for Standardisation
LNE	Lower North East
MIG	Montreal Implementation Group
NPESRR Act	<i>National Park Estate (Southern Region Reservations) Act 2000</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NPWS	National Parks and Wildlife Service (now part of DECC)
NSW FA	NSW Forest Agreement (Agreements between NSW Ministers)
NT Act	<i>Native Title Act 1993 (Cwth)</i>
NV Act	<i>Native Vegetation Act 2003</i>
NVC Act	<i>Native Vegetation Conservation Act 1997</i>
NV Regulation	Native Vegetation Regulation 2005
PAS	priorities action statement
P&R Act	<i>Plantations and Reafforestation Act 1999</i>
P&R Code	Plantations and Reafforestation (Code) Regulation 2001
PGP	permanent growth plot
PMP	park management program
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PVP	property vegetation plan
PWG	Parks and Wildlife Group of DECC
RACU	Resource and Conservation Unit
RFA	Regional Forest Agreement
RFA Act	<i>Regional Forest Agreement Act 2002 (Cwth)</i>
RF Act	<i>Rural Fires Act 1997</i>
RLPB	Rural Lands Protection Board
SCA	state conservation area
SEEDS	Social, Environmental and Economic Database System
Seeing	Social, Environmental and Economic Report
SFNSW	State Forests NSW
SIMI	Statement of Interim Management Intent
TPHG Act	<i>Timber Plantations (Harvest Guarantee) Act 1995</i>
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TSL	threatened species licence
UNE	Upper North East
VCA	voluntary conservation agreement
VDS	visitor data system
Wildlife Atlas	Atlas of NSW Wildlife
WSA	wood supply agreement

1. Executive summary

1.1. Background

Between 1999 and 2001 the NSW and Australian Governments signed three 20-year Regional Forestry Agreements (RFAs), establishing a framework for the management and use of forests in key forestry regions of NSW. These sought to implement effective conservation, forest-management and forest-industry practices in these regions.

This draft report summarises progress on implementation of the RFAs (Eden 1999–2004, North East 2000–2005, and Southern 2001–2006). These are the first of regular five-year progress reports for each RFA and show the extent to which milestones have been met and the results of the monitoring of sustainability indicators.

The RFAs seek to balance the full range of environmental, social, economic and heritage values that forests can provide for current and future generations. They grew out of the 1992 *National Forest Policy Statement* (NFPS) in which governments outlined broad national goals to achieve their vision of our forest estate and to ensure the community obtained a balanced return from all forest uses. There are currently 10 RFAs in Australia.

Scientific Comprehensive Regional Assessments of forest values and uses and consultation with stakeholders were at the heart of the process leading up to the Agreements. Together, they resulted in a world-class forest conservation reserve system to protect biodiversity, old-growth forests and wilderness, secure access to wood resources and provide certainty for the future of forest-based industries. The CRAs broke new ground and added immensely to Australia's storehouse of knowledge about forest uses and values.

The Australian Government's role is to coordinate a national approach to environmental and industry-development issues. The State Government has constitutional responsibility for forest management in NSW through the Department of Environment and Climate Change (DECC) and Forests NSW.

Key objectives of the RFAs are:

- to protect environmental values and a world-class system of national parks and other reserves
- to manage all native forests in an ecologically sustainable way, and
- to encourage job creation and growth in forest-based industries, including wood products, tourism and minerals.

The RFAs are given legislative status through the *Regional Forest Agreements Act 2002* (RFA Act). The RFA Act precludes any controls under the *Export Control Act 1982* being applied to wood sourced from an RFA region while an RFA is in force.

This draft report records progress against agreed milestones in the first five years of each agreement. The draft report covers the management of reserves, protection of threatened species and cultural heritage, advances in environmental management systems, and the auditing, reporting and measuring of long-term wood supply volumes from production forest.

This draft report will provide the public with information on the progress of implementing the RFAs, and enable the public to provide comments. The public consultation will occur over two months. This report, along with public comment and response to these comments will then be reviewed by an independent assessor on behalf of the Australian and NSW governments. A final report on progress with implementation of the NSW RFAs will be presented to both governments. This will cover the outcomes of the review, including consideration of public submissions, details from the report of the independent assessor and any further work required such as completion of incomplete milestones and recommended amendment to the RFAs. The final report will be tabled in the Australian and NSW parliaments.

This draft report covers all three RFA regions and discusses the background of the review and aspects of the RFAs that have changed. It also provides progress against milestones, and summarises the results of monitoring the Ecologically Sustainable Forest Management (ESFM) indicators.

The North East RFA covers both the Lower North East (LNE) and Upper North East (UNE) NSW Forest Agreement¹ (NSW FA) Regions.

Summary of environment and heritage

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national scheme of environment and heritage protection and biodiversity conservation. This Act applies to matters of national environmental significance, including World Heritage properties, National Heritage places, and nationally listed threatened species and ecological communities. The EPBC Act does not apply to forestry operations in RFA regions where those operations are in accordance with an RFA. The NSW RFAs provide for environmental protection in respect of forestry operations through management prescriptions and a reserve system.

Comprehensive Regional Assessments for the RFAs paved the way for the protection of forest biodiversity, old-growth forests and wilderness areas through the development of a Comprehensive, Adequate and Representative (CAR) reserve system. The CAR reserve system ensures the conservation and protection of environment and heritage values. The system is based on nationally agreed criteria for the protection of forest biodiversity, old-growth and wilderness values. These are known as the JANIS (Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee) criteria.

Progress on reserve management is set out in section 4.7 of this draft report. The RFAs required NSW to complete and publish plans of management for areas under the *National Parks and Wildlife Act 1974* (NPW Act). This report shows that in the review periods, of 425 national parks, nature reserves, state conservation areas, historic sites, Aboriginal areas and regional parks identified in the three regions, 191 had plans of management adopted by the relevant NSW Minister and were being implemented. Others were in various stages of preparation.

The implementation of the RFAs saw the reservation under the CAR reserve system, including new and pre-existing dedicated reserves, informal reserves and values protected by prescription, of 267,800 hectares of forest in Eden, 2,140,700 hectares of forest in the North East, and 1,421,000 hectares of forest in the Southern RFA areas. Across these three regions, more than 30% of forests are in reserves. This exceeds the IUCN reserve target of 10%, widely adopted throughout the world as the minimum threshold for conservation purposes. Almost all wilderness on public land as defined in the JANIS reserve criteria in NSW is included in the dedicated reserve system.

Under the RFAs, the NSW and Australian Governments agreed to finalise statewide guidelines for the management of cultural heritage values and sites. Section 4.10 (Milestone 25) indicates

¹ In this document the term 'NSW Forest Agreement' means the forest agreements made by NSW Ministers under the *Forestry and National Park Estate Act 1998* and not the Regional Forest Agreements between the Australian and NSW Governments.

that statewide guidelines were produced. DECC and Forests NSW are managing cultural heritage values and sites.

Summary of ecologically sustainable forest management

Ecologically sustainable forest management (ESFM) of both reserves and production forests is a key objective of the RFAs. The RFAs build on existing NSW processes and regulations and encourage integration of complementary strategic systems.

Many forest management improvements were required by the RFAs. These included:

- the development of ESFM plans
- environmental management systems (EMS), and
- cooperation among agencies on control of feral and introduced pests and noxious weeds, bushfire prevention and grazing management.

Forests NSW has prepared management plans for protected areas. Forests NSW and DECC have frameworks for monitoring and reporting against ESFM criteria and indicators. A Biodiversity Strategy, codes of practice for timber harvesting on private land, silvicultural practices guidelines, improved information sharing mechanisms and integration of management between all levels of government have been developed.

This draft report documents progress on initiatives towards ecologically sustainable management in NSW native forests. Chapter 4 discusses the progress of milestones including many ecologically sustainable forest-management initiatives.

The ESFM criteria and indicators are the main tool by which changes in forest values are monitored over time in the forest agreement regions. Monitoring is carried out to measure ecologically sustainable forest management. The results of monitoring of sustainability indicators are detailed in chapter 5, with some supporting information to milestone discussions.

Threat abatement and recovery plans relating to biodiversity and threatened species were implemented. Some of the obligatory recovery plans for threatened species originally required under the RFAs were replaced, under NSW legislation, by a system of priority action statements to address the majority of threats, with the use of recovery plans and threat abatement plans when additional measures are needed. Recovery planning processes for nationally listed threatened species have also been subject to legislative changes since signing of the RFAs.

Environmental management systems were developed in all three RFA areas during the first five years of each agreement. On the reserve estate, improvements were delivered through the development of manuals, procedures, standards and communication under the Park Management Program (PMP). Forests NSW developed and implemented an environmental management system under ISO 14001:2004 for native and planted forests (certification received in June 2006). Forests NSW was certified as compliant with the Australian Forestry Standard (AFS) AS 4708 (int-2003) in December 2006.

Integrated control programs for bushfire management, feral animals and noxious weeds were implemented under the RFAs, creating better coordination at state and local levels. This draft report notes that wildfire was the major factor influencing the health and vitality of forest ecosystems during the reporting period. From 24 December 2001 to 16 January 2002, more than 700,000 hectares of NSW burnt by bushfire, followed by even more severe fires in 2002–2003 where more than 1.45 million hectares were burnt. Monitoring of post-fire ecosystem recovery is continuing.

Summary of jobs and forest industries

The RFAs were also designed to encourage development of an internationally competitive timber industry by providing certainty for forest-based industries and the setting of minimum supplies of high-quality large sawlogs.

The Export Control (Regional Forest Agreement) Regulations 1997 provided that, as the RFA came into force, all export controls on woodchips and other processed wood from an RFA region (except product sourced from plantations) were lifted, thus removing controls in relation to application of the *Export Control Act 1982* (Cwth).

In the North East, the NSW Government committed to supplement the timber supply with the purchase of private land and/or timber rights to supply high-quality large sawlogs. This draft report shows that to the end of June 2005, Forests NSW had sourced an additional 152,401 cubic metres of standing high-quality large sawlog resource. Further, Forests NSW have established 7543 hectares of hardwood plantation in the North East RFA region between 1999 and 2004.

Under the RFAs, the NSW Government was required to review its sustainable yield estimates in the North East to see that harvesting was within sustainable limits. This was achieved by September 2004.

This draft report records that by the end of 2006, Forests NSW had completed a broad series of improvements to its Forest Resource and Management Evaluation System (FRAMES) modelling, based on Professor Vanclay's review in 2002 of systems in place on the NSW North Coast. This involved updating of models, further data collection, development of simulation and prediction tools and easier reporting functions.

A comprehensive review of sustainable yield using improved FRAMES is under way for the South Coast, to be completed by June 2009.

Outlines of each chapter of this draft report are set out below.

1.2. Purpose of the review

Chapter 2 introduces the Regional Forest Agreements (RFAs) and the background and purpose of the review.

Each RFA is subject to five-yearly reviews. The purpose of each review is to provide an assessment of progress of the RFA against the established milestones, and will include:

- the extent to which milestones and obligations have been met, including management of the National Estate
- the results of monitoring of sustainability indicators, and
- invited public comment on the performance of the RFA.

The review of the NSW RFAs will not lead to renegotiation of the agreements. However, both parties may agree to some minor modifications to incorporate the results of the review as set out in clause 8 of each RFA.

1.3. Post-RFA changes to the forest management system and additional reserves

Chapter 3 summarises changes that have taken place since signing of the RFAs such as changes to legislation and associated processes, name and definition changes, including reallocation of responsibilities among agencies, and revised sustainability indicators. These have occurred at both federal and state levels. Some changes are contained within the discussion on the progress of milestones in chapter 4. Major changes that are addressed include:

- replacement of the Native Vegetation Conservation Act 1997 by the Native Vegetation Act 2003 and Native Vegetation Regulation 2005;
- changes to numerous departmental names and responsibilities

- changes to reserve categories in the NPW Act including the addition of state conservation areas
- expansion of the reserve system
- revision of the Montreal Indicators used as the basis for developing the sustainability indicators (NSW ESFM Indicators), and
- repeal of the *Australian Heritage Commission Act 1975* and amendment of the EPBC Act to provide for a National Heritage List to replace the Register of the National Estate.

1.4. Key progress of milestones

Chapter 4 outlines progress against established milestones specified in each RFA (and summarised in Appendix 1). Reporting on progress covers the first five years of each RFA, for all milestones listed in attachment 4 of Eden RFA and attachment 5 of North East and Southern RFAs and taking into account the reporting period. Note that:

- if a milestone was due during the first five years, but was completed by 30 June 2008, it is discussed as completed even if it was completed after the first review period, and
- if a milestone is still in progress, and applies to all three RFA regions, then the progress will be discussed up to 30 June 2006, and
- progress to 30 June 2008 is reported against some milestones (e.g. recovery planning and management plans).

Reporting and tabling

All RFAs have been tabled in the Australian Parliament. Annual reporting on the achievement of milestones in each RFA has occurred for the first five years. Reporting on the RFAs was aligned to cover financial years and reporting for the NSW Forest Agreements (NSW FAs). Most RFA annual reports have been tabled in the Australian Parliament.

An Integrated Forestry Operations Approval (IFOA) for the UNE, LNE and Eden regions commenced on 1 January 2000. The IFOA for the Southern region commenced on 13 May 2002. Annual reports on the NSW FAs and IFOAs have been prepared and cover the UNE, LNE, Southern and Eden regions.

Reserve management

Completion of management plans for areas covered by the NPW Act are continuing. Where management plans are not in place, parks are managed in accordance with the requirements of the NPW Act.

The first *State of the Parks* report (NPWS 2001) was released in November 2001. The second *State of the Parks* report (DEC 2005) was released in June 2005. These reports include information on the effectiveness of park management.

Comprehensive Adequate and Representative reserve system

In establishing the CAR reserve system, additional national parks, nature reserves, Crown Reserves and flora reserves were created by the *Forestry and National Park Estate Act 1998* for the Eden and North East regions. In the Southern region, additional dedicated and informal reserve components were established with the passage of the *National Park Estate (Southern Region Reservations) Act 2000*.

Threatened species management

Initially, recovery plans were to be prepared for each of the species listed in the RFAs. However the statutory requirements for the preparation of threatened species recovery plans were changed in NSW in 2005 and at the Australian Government level in 2007. Rather than recovery plans being obligatory for each threatened species, the NSW *Threatened Species Legislation Amendment Act 2004* established a requirement to prepare a Priorities Action Statement (PAS).

The Australian Government's EPBC Act now gives the Minister discretion to decide whether to have a recovery plan for a listed species or ecological community, or to have the entity addressed through conservation advice only. All species and ecological communities that had a recovery plan in preparation prior to the amendments to the EPBC Act will continue to have the plan finalised unless the Minister decides not to have a recovery plan.

The development of threat abatement plans is an important component of the threatened species management framework. For example, the NSW Threat Abatement Plan for the European red fox was approved in December 2001.

Cultural heritage values

Cultural values on DECC reserves are managed according to DECC legislative responsibilities and existing statewide policies and guidelines. Forests NSW heritage guidelines are attached to the IFOAs for the UNE, LNE, Eden and Southern regions. The guidelines describe planning, operation, monitoring and review processes for managing cultural heritage.

Environmental Management Systems

The Environmental Management System (EMS) for park management is being delivered through the Park Management Program (PMP). The PMP establishes systems that facilitate improved coordination and guide park management.

Forests NSW EMS provides for continuous improvement in environmental management in native and planted forests. Forests NSW finalised elements of its corporate systems and reviewed its management to obtain its external certification in ISO 14001:2004 (EMS) in June 2006. In December 2006, Forests NSW was certified as compliant with the Interim Australian Forestry Standard (AFS) (AS 4708 (int) 2003) by NCS International.

Integrated control programs for bushfires, feral animals and weeds

DECC and Forests NSW ensure an integrated approach to fire management through participation in the NSW Bush Fire Coordinating Committee. The committee is responsible for statewide planning in relation to bushfire prevention, and for advising the NSW Rural Fire Service Commissioner on bushfire prevention, mitigation and coordinated bushfire suppression.

Pest animal and weed management are integrated into the ESFM plans of Forests NSW and into DECC regional pest management strategies, threatened species priorities action statements, and reserve management plans.

Audit, review and reporting processes

Forests NSW has an internal audit system which audits all forestry operations. Forests NSW reports compliance and monitoring in its *Social, Economic and Environmental (Seeing) Report*. DECC undertakes external auditing of Forests NSW activities to ensure compliance with the Threatened Species Licence and Environment Protection Licence. Information on compliance is provided in the NSW FA annual reports.

DECC and Fisheries also have internal review and reporting processes.

Forests NSW management

The ESFM plans produced by Forests NSW provide a blueprint for achieving ecologically sustainable forest management on State forests and other Crown timber lands. They set out the broad strategies, performance indicators and measurement outcomes for forest management in each region over a five-year period.

ESFM plans for Eden, LNE, UNE and Southern regions were finalised in August 2005.

Forests NSW published a *Native Forest Silviculture Manual* in September 2000.

Timber supply supplementation

At 30 June 2005, 11 properties had been purchased across the North East region under the Private Property Timber Supplementation Program. These cover an area of more than 13,000 hectares of native forest with an estimated standing volume of 141,439 cubic metres of high-quality large quota sawlogs.

Forests NSW established 7543 hectares of hardwood plantation in the North East region between 1999 and 2004.

FRAMES improvements, sustainable yield and volume review

In relation to FRAMES (Forest Resource Assessment and Management Evaluation System) improvements, by the end of 2006 Forests NSW completed a broad series of improvements to its FRAMES modelling. Specifically:

- Biometrics improvements including growth models have been updated for all areas using recent permanent growth plot measurement data, models have also been simplified to improve robustness with respect to implementation and testing, and further data were collected and analysed to improve the recovery factors, volume functions, taper functions, height/diameter functions and tree-product apportionment equations biometrics
- Growth and yield simulation improvements have been made including changes to the reports in FRAMES so they provide species-level yield trends, changes have been made to the modelled product mix to provide more realistic and flexible product categories, new reports have been developed that include the profiles of average pre- and post-harvest stand states for plots that meet the harvest criteria, and silvicultural and harvesting assumptions have been updated as a result of silviculture studies on the North Coast
- Area management improvements have included the restructuring of the strategic net area management toolkit to become a grid-based area prediction tool for the North Coast region
- Estate model improvements have included changes to the estate modelling system to facilitate more reliable and efficient yield scheduling and reporting at a range of spatial levels; inclusion of resource growth and yield estimates defined at a subregional level, and model changes made to ensure that only appropriate silvicultural intensities are applied to defined management areas, and
- Eden-specific improvements have included a shift from Spectrum/StandSim to Woodstock for yield scheduling analysis of the outputs from REDEN (an inventory-plot management and yield simulation system).

The Forests NSW Forest Inventory Policy was released in 2004. A key feature of this policy is the systematic re-measurement of plots in areas where harvesting has occurred. The policy also includes programs to improve the biometrics used in FRAMES estimations of current and future yields.

The improvements to FRAMES and sustainable yield calculations up to 2002 were reviewed by Professor Vanclay of Southern Cross University in 2002 in a report entitled *Review of Projected Timber Yields for the NSW North Coast*.

Forests NSW undertook a *Review of Wood Resources on the North Coast* in 2004, which provided a revised sustained yield volume of 222,000 cubic metres for the first five years and then 200,000 cubic metres from year 6 to 20 years.

A comprehensive review of FRAMES for the South Coast is currently underway and is expected to be completed by June 2009.

Following the implementation of the REDEN inventory-plot management and yield simulation system and Woodstock yield scheduling tool in Eden in 2002–03, resource analysis work has focused on short-to-medium-term timber-availability issues. Evaluation and refinement of the preliminary results in 2004 confirmed that the wood supply agreement (WSA) yields could be maintained.

Timber supply on the North Coast was subject to a comprehensive review in 2003 following changes to Forests NSW forest estate announced by the NSW Government. Subsequent changes to the Wood Supply Agreements were negotiated and finalised with Industry in 2004–05 and have extended the commitment period from 2018 to 2023.

Review conclusions

Review conclusions for each milestone are listed in Appendix 1.

1.5. Results of monitoring – criteria and indicators

Chapter 5 provides a summary of the outcomes of monitoring across seven criteria and 27 different indicators.

Biodiversity

Some 2,085,415 hectares of forest are in DECC reserves. Key changes since commencement of the RFAs include:

- additions to Chaelundi National Park, Guy Fawkes River National Park, Bald Rock National Park, New England National Park, Barrington Tops State Conservation Area, Medowie State Conservation Area, South East Forest National Park, Mimosa Rocks National Park and Kybeyan Reserve, and
- the gazettal of Wollumbin National Park adjoining Mount Warning National Park and Yurrammie State Conservation Area, Brindabella State Conservation Area, Tallaganda State Conservation Area, Wereboldera State Conservation Area and Yunununbeyan State Conservation Area.

Over the reporting period, growth in the Forests NSW forest estate has remained relatively stable. Most changes were the result of tenure transfers from the Forests NSW estate to DECC reserves.

Large amounts of data on occurrences of forest-dwelling species have been added to the NSW Wildlife Atlas.

Productive capacity of forest ecosystems,

The total area of state forest managed by Forests NSW, including plantations, is approximately 1.66 million hectares. Of the 1.29 million hectares of native forest some 53% is estimated to be available for harvest.

Timber volumes harvested from Forests NSW native forest and hardwood plantation did not exceed the annual volumes permitted under the terms of the NSW FA and IFOA for each region over the reporting period.

Forest ecosystem health

The major factor influencing the health and vitality of the forest ecosystem during the reporting period was fire. During the period, 24 December 2001 to 16 January 2002, over 700,000 hectares of NSW were burnt by bushfire. These fires were then followed by another wildfire in 2002–03 which burnt over 1.45 million hectares. The Southern region was the most extensively affected by bushfire during 2002–03 with over 751,595 hectares of DECC reserves and state forests burnt. DECC reserves were most affected, making up some 97% of the total area burnt.

While some ecosystems require fire for regeneration, the scale and intensity of the fires are likely to have exceeded sustainable thresholds. Monitoring of post-fire ecosystem recovery is continuing.

Bell miner associated dieback is a complex phenomenon in which native forest species, particularly mature eucalypts, develop an unexplained proliferation of psyllids, usually associated with declining tree health and a proliferation of bell miners (bellbirds). This problem increased over the reporting period and is of particular concern in the North East regions.

Soil and water resources

Soil and water resources are generally being managed in a sustainable manner. All areas of state forests are assessed for soil erosion hazard before harvesting commences as part of the harvest planning process. Internal and external audits check compliance against licences, codes and guidelines with respect to soil and water quality following the construction of roads and harvesting operations.

All DECC roads, fire trails and management trails are periodically assessed for soil-erosion hazard and, where necessary, site-varying scientifically based measures to protect soil and water values are implemented.

The widespread fires of 2002–03 had an impact on roads and erosion in DECC reserves. After the fires of 2002–03 all affected fire trails and roads (approximately 570) and all new containment lines (approximately 200 kilometres) were systematically assessed for soil erosion hazard. Site-varying scientifically based measures to protect soil and water values were implemented.

Contribution to carbon cycles

NSW public forests are contributing to the maintenance of global carbon cycles. Over 7 million tonnes of carbon were sequestered from the Forests NSW softwood plantations and over 3 million tonnes from the hardwood plantations.

Social and economic values

Public forests have a wide range of environmental, social, cultural, economic and aesthetic values.

Visitation to the national parks and Forests NSW forest estate remains high.

Over 3.7 million visits were recorded to DECC reserves in the Southern and Eden regions during 2003–04. Over this same period a total of 1.3 million visits were made to DECC reserves in the UNE region and 534,721 visits made to DECC reserves in the LNE region.

Total employment by DECC (direct) and Forests NSW (direct and indirect) has remained relatively stable since 2000–01. At the end of 2005–06, combined employment by Forests NSW and the Parks and Wildlife Group (PWG) of DECC was estimated to be 7615 equivalent full-time (EFT) employees.

The number of recorded Aboriginal objects located across the state has been growing due to increased survey efforts. In 2005–06, the number of Aboriginal objects recorded on-park totalled 4529, with a further 15,153 recorded off-park across all regions. Some 4729 hectares of state forest had predominantly Aboriginal management.

Legal and institutional framework

The legal and institutional framework continues to provide a robust framework for forest management in NSW.

A range of educational and staff-training programs focusing on Ecologically Sustainable Forest Management are continuing in the Forests NSW estate and DECC reserves.

The DECC *State of the Parks* reports, Forests NSW *Seeing Report*, ESFM monitoring in the NSW Forest Agreement Implementation Reports and Australia's *State of the Forests* reports provide regular reports on monitoring at the national, state and regional level.

Forests NSW research and development objectives are delivered primarily by the Forest Resources Research Unit. This unit is located in the Department of Primary Industries (DPI) Forest Science Centre. DECC is continuing its research efforts into forest ecology.

2. Background information on the agreement and its review, including milestones

2.1. Introduction

The State of New South Wales (NSW) and the Commonwealth of Australia signed the three RFAs between 1999 and 2001. The dates of signing, expiry and the first five-year review periods are set out in Table 2.1. Note that closing dates for each review period have been adjusted to coincide with the standard annual reporting period in June of the fifth year of each RFA.

Table 2.1: RFAs – date of signing, date of expiry and review period

<i>RFA</i>	<i>Date of signing</i>	<i>Date of expiry</i>	<i>Review period</i> ²
Eden	26 August 1999	26 August 2019	August 1999 – June 2004
North East	31 March 2000	31 March 2020	March 2000 – June 2005
Southern	27 April 2001	27 April 2021	April 2001 – June 2006

The purposes of the RFAs are to:

- (a) identify areas in the region or regions that the parties believe are required for the purposes of a Comprehensive, Adequate and Representative Reserve System, and provide for the conservation of those areas
- (b) provide for the ecologically sustainable management and use of forested areas in the regions
- (c) provide for the long-term stability of forests and forest industries, and
- (d) have regard to studies and projects carried out in relation to all of the following matters that are relevant to the regions:
 - (i) environmental values, including old-growth, wilderness, endangered species, National Estate values and World Heritage values;
 - (ii) indigenous heritage values
 - (iii) economic values of forested areas and forest industries
 - (iv) social values (including community needs), and
 - (v) Principles of Ecologically Sustainable Forest Management.

The duration of each RFA is 20 years with a requirement for five-yearly reviews. Each RFA can be extended with the agreement of both parties as part of the third five-yearly review.

The three RFAs in NSW were developed as a result of Comprehensive Regional Assessments (CRAs) undertaken by the Australian Government, and the Government of NSW.

Each of the NSW RFAs includes requirements for reporting. This occurs through:

- annual reports for the first five years, and
- five-yearly independent reviews of performance against the specified milestones and commitments.

² Note: The review period extends to the standard annual reporting period in the fifth year of each RFA.

2.2. Commitments over the life of the RFAs

The RFAs include a number of clauses that express the long-term intentions of the parties to protect forest values in perpetuity and enhance the management of forests as research continues and new information becomes available.

The NSW Government is currently conducting a review of the NSW Forest Agreements and the Integrated Forest Operations Approvals, as required by the NSW *Forestry and National Park Estate Act 1998* (FNPE Act), which will include a public consultation period. This review will contribute to improving outcomes for NSW forests.

NSW has also made numerous additions to the reserve system since signing the RFAs. These are summarised in section 3.4 Additional areas.

National Estate values have continued to be protected through NSW moves to include heritage sites on state-based registers and to care for them under state heritage legislation.

2.3. Requirements for five-yearly reviews

The three RFAs require that:

‘Within each five year period, a review of the performance of the Agreement will be undertaken. The purpose of the five-yearly review is to provide an assessment of progress of the Agreement against the established milestones, and will include:

- the extent to which milestones and obligations have been met, including management of the National Estate
- the results of monitoring of sustainability indicators, and
- invited public comment on the performance of the Agreement.’

The mechanism for the review is to be determined by both the parties before the end of the five-year period and the review will be completed within three months.

The Australian Government will table the annual reports detailing achievement of the milestones for the first four years of each RFA, and the first five-yearly review on performance against milestones, in the Australian Parliament.

2.4. Principles for conduct of the review

The purpose of this review is to provide an assessment of progress of the implementation of the RFAs against the established milestones as specified in the Eden RFA (attachment 4), the North East RFA (attachment 5), and Southern RFA (attachment 5).

In undertaking the review the parties agree that they are jointly responsible for the review and agree to undertake such measures as are necessary to ensure effective coordination and communication within and between the parties to enable the conclusion of the review.

The review will avoid duplication of processes and will take into account, and utilise, other state and national forest review processes and reporting requirements.

The parties recognise their responsibility to account for the management of NSW forests under the RFAs. Therefore the conduct of the review is to be undertaken in a manner that is:

- open, transparent and equitable
- consistent with other forest management and reporting requirements, and
- reliant on objective, documented information on milestone progress as required by the RFAs.

2.5. Items for the review and limitations

The milestones in the RFAs subject of this review are specified in the Eden RFA (attachment 4); the North East RFA (attachment 5); and Southern RFA (attachment 5). The milestones for all three NSW RFAs are listed in appendix 1.

The review process will not open up the RFA to renegotiation but both parties may agree to some minor modifications to incorporate the results of the review in accordance with clause 8 of the RFA.

2.6. Linkages to other processes

There are a number of processes producing complementary information aimed at reporting on sustainable management of forest ecosystems. These include:

- the reporting against Montreal Process Criteria and Indicators
- Australian *State of the Forests* reporting
- Australian and NSW State of the Environment reporting, and
- NSW reports such as the *State of the Parks Report* and *Forests NSW Social, Environmental and Economic (Seeing) Report*.

In a separate process, NSW will also review the NSW Forest Agreements (FAs) and Integrated Forestry Operations Approvals (IFOAs) as required by the FNPE Act. The review of NSW FAs and IFOAs will include consideration of the ESFM criteria and indicators specified in each NSW FA, being identical to the sustainability indicators referred to in the RFAs.

In addition, the Australian Government, as a signatory to the Montreal Process, is obligated to report under the Montreal Process by December 2008.

To facilitate the linking of these processes, both the Australian and NSW Governments will use their best endeavours to collect and store information in a form that is readily transferable to, and from, other reporting mechanisms.

The approach for the RFA review in NSW is also consistent with arrangements for RFA reviews in other states.

2.7. Roles and responsibilities

Review committee

A joint NSW and Australian Government review committee is facilitating the review.

The review committee has primary responsibility for developing elements of the review, including, where appropriate, reports for the consideration and/or approval of Ministers and determination of the work by the independent assessor. The committee comprises members drawn from both Australian and NSW government agencies involved in the implementation of the RFAs, including the Department of Agriculture, Fisheries and Forestry and the Department of Environment, Water, Heritage and the Arts (Australian); and the Department of Environment and Climate Change (DECC) and the Department of Primary Industries (NSW). The committee is jointly chaired by representatives of the Department of Agriculture, Fisheries and Forestry – Forestry Branch and DECC – Resource and Conservation Unit.

The review committee is responsible for:

- ensuring adherence to the principles that are detailed in the Scoping Agreement
- developing procedures for the operation of the review committee

- preparing the *Draft Report on Progress with Implementation of the New South Wales RFAs* (this report)
- considering and taking account of the public comment on this draft report
- if necessary, addressing queries to government agencies, and to people or organisations who have provided comment on the draft report to clarify outstanding issues and prepare a draft response document
- providing the draft report to the independent assessor for the purpose of reviewing this draft report, public comments, response to comments and any documentation
- drafting the *Final Report on Progress with Implementation of the NSW RFAs* including details on the review process and its findings including outcomes from the review by the independent assessor, and
- drafting the governments' response to the review.

Independent assessor

An independent assessor with expertise and knowledge of the NSW RFAs and sustainable natural resource management will assess the review committee's draft report and public comments, and then compile a report to the Australian and NSW governments. The assessor will be selected based on jointly developed criteria. Terms of reference for the assessor are included at attachment 2 to the Scoping Agreement which is available at <http://www.daff.gov.au/rfa/reviews/nsw>

Parties to this review

The parties to this review are represented by:

New South Wales:

The Hon Carmel Tebbutt MP, Deputy Premier, Minister for Climate Change and the Environment, Minister for Commerce

Australian Government:

The Hon Tony Burke MP, Minister for Agriculture, Fisheries and Forestry

The Ministers will receive this report, the *Final Report on Progress with Implementation of the New South Wales RFAs*, decide on its publication and determine their governments' response to the review findings.

3. Post-RFA changes to the forest management system and additional reserves

This chapter identifies aspects of the RFAs that have changed since they were signed, and discusses important forest management actions which impact on the implementation of milestones and commitments. Some of these matters are also discussed under the corresponding milestones in chapter 4 (e.g. changes to volumes in wood supply contracts or changes to recovery-planning processes).

3.1. Legislative changes

Native Vegetation Conservation Act to Native Vegetation Act

The RFAs refer to the NSW *Native Vegetation Conservation Act 1997* (NVC Act). For example, in the Southern RFA there are references to the Act in clause 51 (Accreditation), clause 53 (Private Land), attachment 4, table 1 (National Estate) and attachment 8 (Improvements to NSW Forest Management Systems).

The NVC Act was replaced with the NSW *Native Vegetation Act 2003* (NV Act) and Native Vegetation Regulation 2005 (NV Regulation). This new legislation introduced in 2005 represented a historic change to the way native vegetation is managed across NSW.

The NV Act and NV Regulation deliver:

- the Government's commitment to end broadscale clearing, in order to protect the health of our land, rivers and wildlife
- investment security and increased flexibility for farmers
- \$436 million over four years from the NSW and Australian governments which will go directly to farmers and other local groups to repair damaged rivers and restore over-cleared landscapes, and
- new powers to local catchment management authorities (CMAs) to make decisions in the best interests of the community.

Through CMAs, local people make local decisions about how to best manage native vegetation in their part of NSW. The new system is based on voluntary agreements between landholders and CMAs known as property vegetation plans (PVPs).

The NV Act requires a proposal for clearing native vegetation to be assessed against whether it will 'improve or maintain environmental outcomes'.

Approvals and plans are developed with the support of a computer modelling program called Native Vegetation Assessment Tools. This program weighs up the positive and negative aspects of different management plans and activities, allowing farmers to make practical decisions based on the best-available scientific information. Experts from the local CMA will use this program together with their professional judgement when assessing clearing proposals. The program uses an environmental outcomes assessment methodology which sets out the circumstances in which clearing is regarded as improving or maintaining environmental outcomes. The impact of clearing is measured against four environmental values – water quality, soils, salinity and biodiversity (including threatened species).

Native vegetation is classified as any species of vegetation that existed in NSW before pastoral settlement, including trees, saplings, shrubs, scrub, understorey, groundcover or wetland plants. Clearing is defined as cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation.

The NV Act and NV regulation also apply to private native forestry. The NSW *Private Native Forestry (PNF) Code* has provisions that are designed to restrict the impact of forestry operations, and to ensure the long-term maintenance of a forest structure. Specifically, the PNF Code has a minimum basal areas retention requirement suited to the specific broad forest type. The PNF Code also has restrictions on the implementation of the Australian Group Selection regeneration method. Further, the PNF Code has requirements for the regeneration and retention of adequate stocking.

The PNF Code prevents forestry operations in both old-growth forest and rainforest. The PNF Code refers to formal identification protocols for both old-growth and rainforest approved by the Minister. The protocols are based on mapping prepared under the CRAFTI (CRA aerial photo interpretation) component of the CRA process, as modified for PNF.

The PNF regulatory process under the NV Act facilitates simple and secure (up to 15 years) approvals to carry out forestry operations provided they are conducted in accordance with the PNF Code. The PNF Code, however, requires compliance with best practice operational standards, excludes forestry operations from protected landscape features, and provides for modified management practices under site-specific circumstances.

NSW Threatened Species Legislation Amendment Act

The statutory requirement for the preparation of threatened species recovery plans was changed by the NSW *Threatened Species Legislation Amendment Act 2004*. Rather than recovery plans being obligatory for each threatened species, the NSW *Threatened Species Legislation Amendment Act 2004* established a requirement to prepare a Priorities Action Statement (PAS).

The PAS approach was undertaken because the preparation of recovery plans for each threatened species became unworkable due to the increasing numbers of species listed under the *Threatened Species Conservation Act 1995* (TSC Act). The rationale for moving towards use of PASs was so that readily identified actions for reducing impacts on threatened species could be implemented immediately rather than waiting for the completion of complex and time consuming, recovery plans.

For more discussion on PAS and recovery plans see section 4.9 of this report – Milestone 22 and section 5.2 – indicator 1.3.

Commonwealth Endangered Species Protection Act

The *Endangered Species Protection Act 1992* was replaced by the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act).

Species Listing and Recovery Planning

The EPBC Act no longer requires a recovery plan for each listed species or ecological community, therefore not all EPBC listed species identified by the RFAs will have recovery plans prepared. Where there is no recovery plan in place or in preparation, a conservation advice will be prepared by the end of 2008.

All species and ecological communities that had a recovery plan in preparation prior to the amendments to the EPBC Act will continue to have the plan finalised unless the Minister decides otherwise.

The EPBC Act governs listing of species and ecological communities (ECs) that are considered to be nationally threatened. A number of NSW species, including forest species and some forest communities, have been listed under the EPBC Act. DECC and DEWHA have not entered into a formal program to align lists under respective legislation. As per s9 of the TSC Act, as soon as practicable after a species or ecological community found in NSW is listed under the EPBC Act, the NSW Scientific Committee will consider whether the species or ecological community should be listed under the TSC Act. DECC and DEWHA will be discussing list alignment during 2009.

See section 4.9 including discussion on recovery planning and Section 5.2 – Indicator 1.2.b and 1.3 for additional discussion on threatened species and management measures.

National Estate

In 2003, the Australian Government repealed the *Australia Heritage Commission Act 1975* (refer Act No. 86 of 2003). With the repeal of this Act the Australian Heritage Commission ceased on 31 December 2003.

In 2003 the *Australian Heritage Council Act 2003* (AHC Act) was enacted and the EPBC Act was amended to provide for a new body, the Australian Heritage Council, and established the National Heritage List to replace the Register of the National Estate. At the time, it was jointly agreed to suspend further work on identifying places to add to the register, pending the outcomes of the legislative amendments.

The National Heritage List has been established to list places of outstanding heritage significance to Australia. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation. The National Heritage List is compiled and maintained by DEWHA and can be searched using the Australian Heritage Database <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>.

Following further amendments in 2006 to the EPBC Act and the AHC Act, the Register of the National Estate (RNE) was frozen (19 February 2007) which means that no new places can be added, or any existing places, or values of places, removed from the RNE. The Australian Government Minister responsible for matters of national heritage is required from this date to consider information in the RNE in the course of any decision making under the EPBC Act for a period of five-years. From February 2012, the Register of the National Estate will be maintained on a non-statutory basis as a publicly available archive. The Australian Government has invited state governments to consider whether any places listed on the Register should be accorded any ongoing status under state legislation.

In the 2004 *National Heritage Protocol – Statement of Roles and Responsibilities*, governments agreed that: 'if there are constitutional limitations in the application of Commonwealth power to protect national heritage values of a national heritage place located in a state, the state government will use its best endeavours to ensure the national heritage place is protected to the maximum possible level through the application of state legislation'.

World Heritage

World Heritage properties within the RFA regions are subject to provisions of the EPBC Act.

The *National Heritage Protocol*, agreed by the Environment Protection and Heritage Council in April 2004, states that as a general principle, future nominations for World Heritage inscription will be drawn from the National Heritage List (NHL). The Commonwealth is working with the states and territories through the Environment Protection and Heritage Council to develop a tentative list for submission to the World Heritage Centre. This is consistent with the Operational Guidelines for the Implementation of the World Heritage Convention (the Operational Guidelines) which requires that each State Party prepares an inventory of properties within its territory that the State Party considers suitable for future inscription on the World Heritage List and submits it as a tentative list.

The Greater Blue Mountains World Heritage Area was listed in 2000. No other World Heritage nominations have involved the RFA regions in NSW.

3.2. Departmental names

The implementation of RFAs is a cooperative undertaking between various government agencies. Over the first five years that the RFAs were in place, the names of various departments changed. Reporting against milestones in this draft report uses the current name for each agency. The following indicates which previous agencies are captured by the current names:

- Department of Environment and Climate Change (DECC) – captures Department of Environment and Conservation (DEC), National Parks and Wildlife Service (NPWS), Environment Protection Authority (EPA); Department of Infrastructure, Planning and Natural

Resources (DIPNR) including Planning NSW and Department of Land and Water Conservation, Resource and Conservation Unit/Division

- Forests NSW – captures State Forests NSW (SFNSW)
- Department of Primary Industries (Fisheries) – captures NSW Fisheries, and
- Department of Primary Industries (Minerals) – captures Department of Mineral Resources.

Other points to note:

- DIPNR was formed through amalgamation of the Department of Planning (Planning NSW) and the Department of Land and Water Conservation (DLWC) in July 2003.
- DEC was formed through the amalgamation of the EPA, NPWS, Botanical Gardens Trust and Resource NSW in September 2003. While the entity of the EPA still exists, its functions are managed through a division of DECC.
- DECC was formed in April 2007, and includes parts of the Department of Natural Resources (in particular vegetation management functions, and the Resource and Conservation Unit).
- The former NPWS still exists but is now part of DECC, and is largely encompassed by the Parks and Wildlife Group (PWG) of DECC. Throughout this report key responsibilities of the former NPWS may be referred to as 'NPWS', 'DECC' or 'DECC PWG'.
- Department of Primary Industries (DPI) was formed in July 2004 by amalgamating State Forests of NSW (SFNSW), NSW Fisheries, Department of Agriculture and Department of Mineral Resources. SFNSW became a trading entity and was renamed Forests NSW.
- Department of Primary Industries (DPI) also obtained the plantations section of the former Department of Natural Resources in April 2007.
- The functions of science and research (excluding tree and plantation improvement), communications and public relations and forest policy were transferred from Forests NSW to DPI effective 1 July 04. These services are now provided under a service level agreement.
- The Resource and Conservation Unit (RACU), formerly the Resource and Conservation Division, was within the Department of Planning until July 2003, and provided the secretariat services to the Resources and Conservation Assessment Council. Other names for the former Resource and Conservation Division included: the Strategic Assessments and Analysis Group in Department of Planning from August 2004 to March 2005; Forestry and Rural Industry Policy (FRIP) in DIPNR from March 2005 to 26 August 2005 and FRIP in Department of Natural Resources from 26 August 2005 to 30 June 2006. FRIP became RACU when it moved to the Department of Premier and Cabinet on 1 July 2006. RACU moved to DECC on 27 April 2007.
- The former Environment Australia and Department of the Environment and Heritage are now the Department of the Environment, Water, Heritage and the Arts (DEWHA).
- The Australian Heritage Commission ceased on 31 December 2003 with the repeal of the *Australian Heritage Commission Act 1975*.
- References to names of departments, and agencies, have not been changed in references to the original RFA clauses, or where documents are referenced.

3.3. Reserve categories

The *National Parks and Wildlife Amendment Act 2001* instigated changes to the *National Parks and Wildlife Act 1974* (NPW Act), including changes to reserve categories in late 2002. State game reserves were abolished as the category was not in use, and the conservation purposes could be achieved through other reserve categories. State recreation areas which had provided for recreation and mining were also abolished.

Regional parks are now the reserve category that focuses primarily on recreation uses and the provision of mining was maintained through the establishment of the new reserve category of State Conservation Areas (also see discussion under milestone 19 regarding state conservation areas

and Crown reserves). Management principles were added to the NPW Act to clearly outline the purposes of each reserve category. Additionally, changes were made to the Act to ensure that any proposed land to be purchased for inclusion in the reserve system is consistent with the establishment of a comprehensive, adequate and representative (CAR) reserve system (see section 7 (2) (b) of the NPW Act).

3.4. Additional areas

The RFAs allow for the continuous improvement of ESFM, including the freedom to respond to new information. The NSW Government has decided since signing of the RFAs to add further forested areas to the reserve system. These additions were delivered by various acts of parliament. Table 3.1 outlines the area that was added to the reserve system by each Act. Within each Act the additions are outlined in schedules.

The additions included:

- areas added to the dedicated reserve system and declared special management zones under the *National Park Estate (Reservations) Act 2002* and section 21a of the *Forestry Act 1916* in the Upper and Lower North East regions. It was assented to on 18 December 2002
- additional areas of national park, nature reserve and state conservation areas or land vested in the NPW Minister reserved on behalf of the Crown in the Upper and Lower North East regions under the *National Park Estate (Reservations) Act 2003* (assented to on 7 July 2003). Additionally, areas previously available for timber harvesting were declared special management zones under section 21A of the *Forestry Act* in the Upper and Lower North East regions.
- additional reserves created in the Southern region by the *National Park Estate (Reservations) Act 2005* (assented to on 17 November 2005)
- additional reserves in the LNE region added by the *National Park Estate (Lower Hunter Region Reservations) Act 2006* (assented to on 21 November 2006).

See section 5.2 – indicator 1.1.a of this draft report for more details on the additions including the ecosystems and vegetation types protected.

Table 3.1: Area added to the reserve system by each Act since the RFA

Relevant Act	Reserve additions				
	Area (hectares)				
	Date	UNE	LNE	Southern	Eden
<i>National Park Estate (Reservations) Act 2002</i> ³	1/01/2003	65,799	54,624	22,292	1241
<i>National Park Estate (Reservations) Act 2003</i> ⁴	1/07/2003	14,573	27,696	na	na
<i>National Park Estate (Reservations) Act 2005</i> ⁵	17/11/2005	na	na	6554	na
Delayed transfers from <i>National Park Estate (Reservations) Act 2003</i>	1/07/2006	60	58	Na	na
<i>National Park Estate (Lower Hunter Region Reservations) Act 2006</i> ⁶	1/07/2007	na	14,144	na	na
TOTAL		80,432	96,522	28,846	1,241

na = not applicable

3.5. Montreal Implementation Group (MIG) indicators

Under the RFAs reporting against criteria and indicators is to be carried out in accordance with *A Framework of Regional (Sub-national) Level Criteria and Indicators of Sustainable Forest Management in Australia* (Department of Primary Industries and Energy 1998), developed by the Montreal Implementation Group (MIG). An example is clause 48 of the Southern RFA.

Since the signing of the RFAs, these 1998 indicators have been updated. In 2007, *Australia's Sustainable Forest Management Framework of Criteria & Indicators 2007 – Policy Guideline* was released, which provided seven criteria and 44 indicators. The guideline states that:

- 'These criteria and indicators are based on the international Montreal Process criteria and indicators originally developed in 1995 by 12 countries including Australia which collectively contain 60% of the world's forests'.
- 'This is Australia's second framework of criteria and indicators of sustainable forest management. The original 1998 framework was developed on the premise that the process to report progress towards sustainable forest management is one of continuous improvement, capable of evolving as knowledge increases and as Australian values, issues and concerns relating to forests is better understood. This revised framework represents an improved

³ *National Park Estate (Reservations) Act 2002* can be found at:

[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202002%20No%20137%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202002%20No%20137%22&nohits=y)

⁴ *National Park Estate (Reservations) Act 2003*:

[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202003%20No%2024%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202003%20No%2024%22&nohits=y)

⁵ *National Park Estate (Reservations) Act 2005*:

[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202005%20No%2084%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202005%20No%2084%22&nohits=y)

⁶ *National Park Estate (Lower Hunter Region Reservations) Act 2006* :

[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Lower%20Hunter%20Region%20Reservations\)%20Act%202006%20No%2090%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Lower%20Hunter%20Region%20Reservations)%20Act%202006%20No%2090%22&nohits=y)

understanding of the mechanisms to report sustainable forest management in the Australian context, with indicators that are relevant and meaningful at the forest management, state/territory and national levels, as appropriate’.

Further background on the MIG criteria and indicators is provided in section 5.1 of this draft report and the results of monitoring the ESFM Indicators is provided in section 5.2.

4. Review of milestones

This section provides consideration of milestone progress including further work that is required (such as the completion of milestones that are underway) and any review conclusions.

4.1. Review process

Reporting on progress

The following discussion on the progress of the milestones will include:

- Progress for the years 1–5 for each RFA, for all milestones listed in attachment 4 of the Eden RFA and attachment 5 of the North East and Southern RFAs and taking into account the reporting period. The review period is August 1999 to June 2004 for the Eden RFA, March 2000 to June 2005 for the North East RFA and April 2001 to June 2006 for the Southern RFA.
- If a milestone was due during the first five years, but was completed by 30 June 2008, it is discussed as completed (e.g. even if it was completed after the first review period).
- If a milestone is still in progress, and applies to all three RFA regions, then the progress will be discussed up to June 2006 (end of first review period for the Southern RFA and extended to cover the reporting period).
- Progress to June 2008 is reported against some milestones such as recovery planning and management plans.

Review conclusions

The following discussion on the progress for each milestone provides a conclusion about the status of the milestone as part of the review deliberations. The various terms used include:

- Completed – action against the milestone has been completed and it will not be discussed in any future review
- Concluded – action against the milestone has concluded, or is no longer being undertaken, and it will not be discussed in any future review
- Underway – action against the milestone has started but is not yet complete. The achievement of the milestone will be discussed in the following review
- To be done – action is still to occur
- Not applicable – the milestone is not relevant for this review, and
- Not required until second five-year review – milestone is not required until second review.

4.2. Process for reviewing and extending the RFAs

Milestone 1

Eden, North East and Southern RFAs – clauses 6

The parties to determine the process for extending the agreement for a further period

As part of the third five-yearly review

Progress of milestone

This milestone is not required until the third five-yearly review.

Documentation

Not applicable

Review conclusion

Not applicable

Milestone 2

Eden RFAs – clause 40 Southern RFA – clause 40 North East RFA clause 42 The parties to determine the mechanism for the five-year review Before the end of the five-year review period

Progress of milestone

A Scoping Agreement which outlines the processes and mechanisms for the five-year review has been signed by the relevant State and Australian Government Ministers. The Scoping Agreement was prepared after considering similar processes in other states and determining how the RFAs review would interact with the review of NSW FAs, as required by the FNPE Act. The review covers the RFAs for the Eden, North East and Southern regions.

To assist with providing input into the review, NSW initiated a system to retain information and provide reports on the progress of milestones using a database.

Documentation

The RFA Scoping Agreement is available at the following web site:
<http://www.daff.gov.au/rfa/reviews/nsw>

Review conclusion

Completed

Milestone 3

Eden RFA– clause 52 (d) Southern RFA – clause 52 (d) North East RFA clause 53 (d) Both parties to further develop, review, and if necessary revise sustainability indicators In time for the first five-yearly review

Progress of milestone

The ESFM indicators (sustainability indicators) referred to in clause 49 of the North East RFA, clause 47 of the Eden RFA and clause 48 of the Southern RFA, are described in Table 1 and Attachment 9 of the NSW FAs for the UNE and LNE regions, Table 2 and Attachment 9 of the Eden FA and Table 2 and Attachment 7 of the NSW FA for the Southern region. The criteria and indicators developed are consistent with the Montreal Process criteria.

Monitoring of these ESFM criteria and indicators has occurred each financial year since 1999–2000 for the Eden and North East (UNE and LNE) regions, and since 2002–03 for the Southern region, as part of the NSW FA annual reporting process required by the FNPE Act. The reports for 1999–2000, 2000–01, 2001–02, 2002–03, 2003–04, 2004–05 and 2005–06 are complete. The report for 2006–2007 is being finalised.

The material presented in chapter 5 summarises the data and discussion that has been presented in the annual reports on the criteria and indicators to 30 June 2006, wherever possible, to provide a comprehensive coverage of the Southern region.

A review of the indicators is part of the review of the NSW FAs required by the FNPE Act and will occur from 2008–09. A notice about the Terms of Reference for the review of NSW FAs was published in newspapers in June and July. The review of indicators will make use of an evaluation framework that was required to be developed by the NSW FAs, and will consider if the indicators are practical, measurable, cost-effective and capable of being implemented at the regional level (as required by the RFA). The review will involve liaison between NSW agencies to further develop, and refine, monitoring and reporting requirements and to ensure linkages to other agencies' processes. Additionally it will also take into consideration the review of the Montreal Implementation Group (MIG) indicators (see sections 4.5 and 5.1 for further discussion of this) to ensure consistency between various reporting requirements.

Documentation

- a) A notice about the Terms of Reference for the review of NSW FAs is at:
<http://www.environment.nsw.gov.au/resources/forestagreements/NoticeProposedTermsRef.pdf>
- b) Further information about the review (including the documents under review) is available online at: www.environment.nsw.gov.au/forestagreements/reviews.htm

Review conclusion

Underway

Milestone 4

North East RFA clause 43

Southern RFA clause 41

Commonwealth will table in the Commonwealth Parliament the first five yearly review on performance against milestones and commitments

Following first five yearly review

Progress of milestone

Not required until the conclusion of the review

Documentation

Not applicable

Review conclusion

Not applicable

4.3. RFA reporting and tabling requirements

Milestone 5

Eden RFA – clause 37 Southern RFA – clause 37 North East RFA clause 39 Parties to report annually on the achievement of milestones in this agreement Annually for the first five years
--

Progress of milestone

Annual reporting on the achievement of milestones in each Agreement has occurred for the first five years. Reporting on the RFAs was aligned to cover a financial year and with reporting for the NSW FAs.

An Interim Report was prepared on North East RFA covering the period 31 March 2000 to 30 April 2001 and an Interim Report on Eden RFA covering the period 25 August 1999 to 30 April 2001. Subsequent reports were prepared for financial years in the Eden and North East RFAs in 2000–01, 2001–02, 2002–03, 2003–04 and 2004–05.

Reports for the Southern RFA were prepared to cover the periods 24 April 2001 to 30 June 2002, and then for financial years 2002–03, 2003–04, 2004–05 and 2005–06.

The progress described in this report may be as reported in annual reports, or it may have been updated and expanded.

Documentation

Annual reports can be found on the web address: <http://www.daff.gov.au/rfa/publications/annual-reports/nsw>

Review conclusion

Completed

Milestone 6

North East RFA clause 43 Southern RFA clause 41 Commonwealth will table in the Commonwealth Parliament the annual reports of achievement of milestones for the first four years Annually

Progress of milestone

Annual reports were tabled by the Australian Government in the Australian Parliament at the following dates for the following regions and periods. Later reports are in the process of being tabled.

Eden RFA

- Interim Report (25 August 1999 – 30 April 2001): tabled in the Senate – 20 June 2002 and House of Representative – 20 June 2002;
- 2000–2001: tabled in the Senate – 1 March 2005 (out-of-session) and House of Representative – 7 March 2005;
- 2001–2002: tabled in the Senate – 1 March 2005 (out-of-session) and House of Representative – 7 March 2005;

- 2002–2003: tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008; and
- 2003–2004: tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008.

North East RFA

- Interim Report (31 March 2000 – 30 April 2001): tabled in the Senate – 20 June 2002 and House of Representative – 20 June 2002;
- 2000–2001: tabled in the Senate – 1 March 2005 (out-of-Session) and House of Representative – 7 March 2005;
- 2001–2002: tabled in the Senate – 1 March 2005 (out-of-Session) and House of Representative – 7 March 2005;
- 2002–2003: tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008; and
- 2003–2004: tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008.

Southern RFA

- 2001–2002: tabled in the Senate – 1 March 2005 (out-of-Session) and House of Representative – 7 March 2005;
- 2002–2003: tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008; and
- 2003–2004 – tabled in the Senate – 19 March 2008 and House of Representative – 19 March 2008.

Documentation

Eden RFA

- a) Interim Report (25 August 1999 – 30 April 2001): tabled in the:
 - Senate – 20 June 2002 (Official Hansard No. 5, 2002 p. 2386)
<http://www.aph.gov.au/hansard/senate/dailys/ds200602.pdf>
 - House of Representative – 20 June 2002 (House Votes and Proceedings (HCV) 29 p.279)
<http://www.aph.gov.au/house/info/votes/40/RVPF029.pdf>
- b) 2000–2001: tabled in the:
 - Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 68)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
 - House of Representative – 8 March 2005 (HVP 20 p.213)
<http://www.aph.gov.au/house/info/votes/41/RVPF020.pdf>
- c) 2001–2002: tabled in the:
 - Senate – 7 March 2005 (Official Hansard No. 5, 2005 pp. 68–69)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
 - House of Representative – 8 March 2005 (HVP 20 p.213)
<http://www.aph.gov.au/house/info/votes/41/RVPF020.pdf>
- d) 2002–2003: tabled in the:
 - Senate – 19 March 2008 (Journals of the Senate p. 1364)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>
 - House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>
- e) 2003–2004: tabled in the:
 - Senate – 19 March 2008 (Journals of the Senate p. 1364)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>

House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>

North East RFA

- f) Interim Report (31 March 2000 – 30 April 2001): tabled in the:
Senate – 20 June 2002 (Official Hansard No. 5, 2002 p. 2386)
<http://www.aph.gov.au/hansard/senate/dailys/ds200602.pdf>
House of Representative – 20 June 2002 (HVP 29 p.279)
<http://www.aph.gov.au/house/info/votes/40/RVPF029.pdf>
- g) 2000–2001: tabled in the:
Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 69)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
House of Representative – 7 March 2005 (HVP 20 p. 214)
<http://www.aph.gov.au/house/info/votes/41/RVPF020.pdf>
- h) 2001–2002: tabled in the:
Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 69)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
House of Representative – 7 March 2005 (HVP 20 pp.214)
<http://www.aph.gov.au/house/info/votes/41/RVPF020.pdf>
- i) 2002–2003: tabled in the:
Senate – 19 March 2008 (Journals of the Senate p. 218)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>
House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>
- j) 2003–2004: tabled in the:
Senate – 19 March 2008 (Journals of the Senate p. 218)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>
House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>

Southern RFA

- k) 2001–2002: tabled in the:
Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 69)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
House of Representative – 7 March 2005 (HVP 20 p.214)
<http://www.aph.gov.au/house/info/votes/41/RVPF020.pdf>
- l) 2002–2003: tabled in the:
Senate – 19 March 2008 (Journals of the Senate p. 218)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>
House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>
- m) 2003–2004: tabled in the:
Senate – 19 March 2008 (Journals of the Senate p. 218)
<http://www.aph.gov.au/hansard/senate/dailys/ds190308.pdf>
House of Representative – 19 March 2008 (HVP 14 p.197)
<http://www.aph.gov.au/house/info/votes/rvpf014.pdf>

Review conclusion

Completed

Milestone 7

North East RFA clause 43

Southern RFA clause 41

Commonwealth will table the signed RFA in the Commonwealth Parliament

Following signature

Progress of milestone

The signed Eden RFA was tabled in the Senate on the 7 March 2005 and in the House of Representative on the 13 October 1999.

The signed North East RFA was tabled in the Senate on the 7 March 2005 and in the House of Representative on 30 May 2000.

The RFA for the Southern region was tabled in both Houses of the Federal Parliament on 20 June 2002.

Documentation

Eden RFA

- a) Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 68)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
- b) House of Representative – 13 October 1999 (Official Hansard pp. 956–957)
<http://www.aph.gov.au/hansard/rep/dailys/dr131099.pdf>

North East RFA

- c) Senate – 7 March 2005 (Official Hansard No. 5, 2005 p. 68)
<http://www.aph.gov.au/hansard/senate/dailys/ds070305.pdf>
- d) House of Representative – 30 May 2000 (Official Hansard p.16537)
<http://www.aph.gov.au/hansard/rep/dailys/dr300500.pdf>

Southern RFA

- e) Senate – 20 June 2002 (Official Hansard No. 5, 2002 p. 2386)
<http://www.aph.gov.au/hansard/senate/dailys/ds200602.pdf>
- f) House of Representative – 20 June 2002 (House Votes and Proceedings 29 p. 279)
<http://www.aph.gov.au/house/info/votes/40/RVPF029.pdf>

Review conclusion

Completed

4.4. NSW Forest Agreements and IFOAs – including reporting

Milestone 8

Eden RFA Attachment 5 Point 2(i)

New South Wales to table in each House of Parliament an annual report on the NSW Eden Region Forest Agreement in accordance with the *Forestry and National Park Estate Act 1998* (NSW) which will include an ESFM report and the outcomes of compliance with any Integrated Forestry Operations Approval for the region

Annually from 1999

Eden RFA clause 49

New South Wales to report annually to Parliament on compliance with any Integrated Forestry Operations Approval for the Eden region and the New South Wales Eden Region Forest Agreement, and to furnish a copy to the Commonwealth

Annually from 1999

North East RFA Attachment 6 2(f)

New South Wales to table in each House of Parliament an annual report on the NSW Upper North East Region Forest Agreement and Lower North East Region Forest Agreement in accordance with the *Forestry and National Park Estate Act 1998* (NSW) which will include an ESFM report and the outcomes of compliance with any Integrated Forestry Operations Approval for the regions

Annually

North East RFA clause 51

New South Wales to report on compliance of the Integrated Forestry Operations Approval for the Upper North East Region and the Integrated Forestry Operations Approval Lower North East Region and furnish the Commonwealth with a copy of these reports

Annually

Southern RFA Attachment 6 Point 2 (g)

New South Wales will report on the Forest Agreement covering the Southern region and on compliance with the IFOA applying to the Southern region

Annually

Southern RFA – clause Attachment 6 Point 2 (h)

New South Wales to table in each House of Parliament an annual report on the New South Wales Southern Region Forest Agreement in accordance with the *Forestry and National Park Estate Act 1998* (NSW) which will include an ESFM report and the outcomes of compliance with any Integrated Forestry Operations Approval for the regions

Annually

Southern RFA clause 50

New South Wales to report on compliance of the Integrated Forestry Operations Approval applying to the Southern region and furnish the Commonwealth with a copy of these reports

Annually

Progress of milestone

An annual report is prepared on implementation of the NSW FAs for the Eden, UNE, LNE and Southern regions, as required by the FNPE Act, and provides progress on:

- achievement of milestones in the NSW FAs each financial year
- monitoring of ESFM criteria and indicators by Forests NSW and DECC each financial year, and
- compliance with the integrated forestry operations approvals.

The annual report for each region was aligned to cover a financial year, and compiled into one report.

The reports are tabled in the NSW Parliament. The 1999–2000 NSW FA Annual Report was tabled (out-of-session) in Parliament on 17 January 2002 in the Legislative Assembly, and on 18 January 2002 in the Legislative Council. The second annual report for the period 1 July 2000 to 30 June 2001 was tabled on 15 November 2006 in both the Legislative Assembly and the Legislative Council. The third annual report for the period 1 July 2001 to 30 June 2002 was tabled on 15 November 2006 in both the Legislative Assembly and the Legislative Council.

The annual reports for 2002–03, 2003–04, 2004–05, and 2005–06 have been prepared and cover the UNE, LNE, Southern and Eden regions. The 2002–03 annual report was the first report that covered implementation of the Southern FA, and compliance with the IFOA for the Southern region. These reports are in the process of being tabled.

Documentation

- a) NSW FA Implementation Reports (Annual Reports) can be found at:
<http://www.environment.nsw.gov.au/forestagreements/monitoring.htm>
- b) NSW Forests Agreements and IFOAs can be found at:
<http://www.environment.nsw.gov.au/forestagreements/agreementsIFOAs.htm>

Legislative Assembly – annual report tabling

- c) 1999–2000
<http://www.parliament.nsw.gov.au/prod/la/latabdoc.nsf/062281a7012b5820ca257020000a3058/ce1f0479911adc89ca256b6d002d29b9!OpenDocument>
- d) 2000–01
<http://www.parliament.nsw.gov.au/prod/la/latabdoc.nsf/062281a7012b5820ca257020000a3058/cb0687f0f56fa095ca25722800003f27!OpenDocument>
- e) 2001–02
<http://www.parliament.nsw.gov.au/prod/la/latabdoc.nsf/062281a7012b5820ca257020000a3058/9c0e9697f1ac9421ca2572280000df89!OpenDocument>

Legislative Council – annual report tabling

- f) 1999–2000
<http://www.parliament.nsw.gov.au/prod/lc/lctabdoc.nsf/cccc870c6126b1b6ca2571ee000318a4/f7cc6bc50ee27b80ca256bd10002dd51!OpenDocument>
- g) 2000–01
<http://www.parliament.nsw.gov.au/prod/lc/lctabdoc.nsf/cccc870c6126b1b6ca2571ee000318a4/52dee1acdd720f19ca257233007b9100!OpenDocument>
- h) 2001–02
<http://www.parliament.nsw.gov.au/prod/lc/lctabdoc.nsf/cccc870c6126b1b6ca2571ee000318a4/20d39e8628f27d4fca257233007bc40c!OpenDocument>

Review conclusion

Reporting completed

Tabling underway

Milestone 9

Eden RFA clause 46(g)

New South Wales to grant an Integrated Forestry Operations Approval covering the Eden region
Within three months of signing

Progress of milestone

The Integrated Forestry Operations Approval (IFOA) for the Eden region was granted on 21 December 1999, and commenced on 1 January 2000.

The IFOAs for the UNE and LNE regions were also granted on 21 December 1999 and commenced on 1 January 2000.

Documentation

IFOAs can be found at:

<http://www.environment.nsw.gov.au/forestagreements/agreementsIFOAs.htm>

Review conclusion

Completed

Milestone 10

Southern RFA clause 34

NSW will have in place a Forest Agreement covering the Southern region and grant an Integrated Forestry Operations Approval applying to the Southern region
By 30 June 2001

Progress of milestone

The NSW FA for the Southern region was signed by the NSW Ministers for Planning, the Environment, Forestry and Fisheries on 3 May 2002.

The IFOA for the Southern region was signed on the 3 May 2002 and commenced on 13 May 2002.

Documentation

NSW FA and IFOA for the Southern region can be found at:

<http://www.environment.nsw.gov.au/forestagreements/agreementsIFOAs.htm>

Review conclusion

Completed

4.5. Regional development initiatives

Milestone 11

Eden RFA clause 17

The parties to develop and consider regional development initiatives to be funded from unspent Commonwealth and State funds committed under the South East Forest Agreement

Within six months of signing

Progress of milestone

Unspent Australian Government South East Forest Agreement (SEFA) funds (\$3.6 million) were committed to the Eden Region Adjustment Program which was announced on 18 August 1999 by Ministers Tuckey (Australian Government Minister for Fisheries and Forestry) and Macdonald (Australian Government Minister for Regional Development). No uncommitted funds remain under SEFA.

Documentation

Not applicable

Review conclusion

Completed

4.6. Research and data management

Milestone 12

Eden RFA clause 87

New South Wales to establish a Research Liaison Committee and publish a list of research priorities

Within 12 months of signing

North East RFA clause 100

New South Wales to establish a Research Liaison Committee and publish a list of research priorities

By August 2000

Southern RFA clause 98

New South Wales to establish a Research Liaison Committee and publish a list of research priorities

By 30 September 2001

Within 12 months of signing

Progress of milestone

A Committee was formed of representatives of DECC, the Department of Planning and Forests NSW in October 2000. A meeting was held in November 2000. Representatives identified current research being undertaken by their agency, and priorities for future research. Future priorities and current research were provided to DECC and are to be included in the [Compendium of Forest Research for 1999–2002](#) (see milestone 13). The committee considered the research needs across all NSW RFA regions including the Southern region (although the Southern RFA had not been finalised at that time).

The committee's work informed the research agendas of the constituent agencies. Research activities, including published papers are reported in agency annual reports (see milestone 13 for details on the annual reports).

Coordination of research activities is continuing. In particular, the Biodiversity Research Network, established under the NSW Biodiversity Strategy, aims to facilitate communication and cooperation among stakeholders interested in biodiversity-related research in NSW. The network includes the following agencies:

- Australian Museum
- CSIRO
- Key Centre for Biodiversity and Bioresources
- NSW Department of Environment and Climate Change
- NSW Department of Primary Industries – Agriculture
- NSW Department of Primary Industries – Fisheries
- NSW Department of Primary Industries – Forests
- Royal Botanic Gardens and Domain Trust
- University of Wollongong Institute for Conservation Biology, and
- Zoological Parks Board of NSW.

Documentation

- a) Committee meeting minutes from November 2000
- b) Biodiversity Research Network at <http://www.environment.nsw.gov.au/biodiversity/biodiversityresearch.htm>

Review conclusion

Concluded

Milestone 13

Eden RFA clause 89 North East RFA clause 102 Southern RFA clause 100 New South Wales to prepare a Compendium of New South Wales Forest Research By the first five-yearly review

Progress of milestone

Contributions have been collated from a range of land management agencies, research organisations and universities on current research being undertaken, future research priorities and published research related to forests covering 1999–2002. Information on current research and future research priorities will be compiled to create a list for inclusion in the compendium of forest research. The compendium will be published in the near future. Reports on research post-2002 can be accessed by following the links provided in the documentation section below.

Forests NSW publishes an annual report on its forest research activities which includes a compilation of all publications and conference papers published throughout the year.

DECC research enables DECC to develop and implement effective environmental, cultural and natural resource policies, programs and regulations, provide technical advice and support, and develop public information programs.

DECC undertakes research in the areas of science, cultural heritage, and social and economic research. This includes the study of rare plants and threatened species and pest animals.

Research under different programs is described on the DECC website, which includes listing of a range of published research papers.

The Botanic Gardens Trust is a part of DECC. The Trust undertakes research within the areas of horticulture, plant systematics, ecology and plant pathology. In addition, the National Herbarium of NSW houses the state reference library of 1.2 million preserved plants.

The annual reports of DECC and the Botanic Gardens Trust include a list of research papers and other publications.

Forests NSW is a supporting member of the CRC for Forestry. The CRC for Forestry mission is to support a sustainable and vibrant Australian forestry industry through research, education, communication and collaboration. Other research relevant to NSW is provided through national organisations including the CSIRO, Forest and Wood Products Australia, and the Joint Venture Agroforestry Program.

Documentation

- a) Forests NSW annual reports on research at:
<http://www.dpi.nsw.gov.au/research/forestry>
- b) DECC research website:
<http://www.environment.nsw.gov.au/research/index.htm>
- c) DECC annual reports and other publications at:
<http://www.environment.nsw.gov.au/publications/>
- d) Botanic Gardens Trust research at:
http://www.rbg Syd.nsw.gov.au/science/Research_programs
- e) Botanic Gardens Trust publications at:
http://www.rbg Syd.nsw.gov.au/welcome_to_bgt/quick_links/publications
- f) Activities of the CRC for Forestry can be found at:
<http://www.crcforestry.com.au/>
- g) Other national forest research activity can be found at:
<http://www.csiro.au/science/forestry.html>
<http://www.fwprdc.org.au/>
<http://www.daff.gov.au/brs/forest-veg>
<http://www.rirdc.gov.au/programs/aft.html>

Review conclusion

Up to 2002 – underway

Post-2002 – concluded

Milestone 14

Eden RFA clauses 92 and 93

New South Wales and the Commonwealth to develop a data agreement and lodge archival copies of data

Within six months of signing

Southern RFA clause 103

North East RFA clause 105

New South Wales and the Commonwealth to lodge archival copies of data

By 30 June 2001

Progress of milestone

A joint NSW/Australian Government archive was completed in July 2001 for the Eden region.

Data agreement finalised in March 2000, and attached to the North East RFA (attachment 13). This agreement is also applicable to Eden. This meets the principles agreed in attachment 13 of the Eden RFA.

A joint NSW/Australian Government archive was completed in July 2001 for the North East region.

A joint NSW/Australian Government archive was completed in November 2004 for the Southern region.

There are two copies of the archive, comprising 5 CDs held under appropriate security for the Australian Government by the Department of Agriculture, Fisheries and Forestry, and by ERIN in the Department of the Environment, Water, Heritage and the Arts. Similarly, the NSW archive is stored in various NSW Government departments including DPI (Forests NSW and Minerals) and DECC.

Documentation

- a) RFAs including the North East RFA are available at: <http://www.daff.gov.au/rfa>
- b) Datasets for which DEWHA is custodian are available for download to the public via Discover Information Geographically <http://www.environment.gov.au/metadateexplorer/explorer.jsp> and the Australian Spatial Data Directory <http://asdd.ga.gov.au/> (search using term 'forest' or 'CRA/RFA' as used in DEWHA metadata), including:
 - Eden RFA – 14 datasets;
 - North East RFA – 34 datasets;
 - Southern RFA – 21 datasets; and
 - statewide – 6 datasets.

Review conclusion

Completed

Milestone 15

Eden RFA Attachment 5 Point 2(d)

New South Wales to publish the results from the Yambulla and Tantawangalo Research Catchments

By the year 2000

Progress of milestone

Tantawangalo

Lane and Mackay published a summary of the data collected during the Tantawangalo studies in the *Forest Ecology and Management* journal in 2001.

Data collection in the Tantawangalo research catchments ceased in 1999 because the research catchments were transferred to DECC reserves during the RFA process.

Yambulla

The Yambulla research catchments have been incorporated into the phase 1 water quality monitoring program undertaken by Forests NSW in compliance with its Environment Protection Licences under the IFOA. Three of the catchments were harvested during 2007 following eight years of pre-harvest water-quality monitoring.

The effects of harvesting activities on water quality, water yield and flow duration are being analysed and will be presented to DECC in the near future.

Once DECC and Forests NSW are satisfied that the research results are statistically robust, papers will be drafted for peer review and publication in scientific journals on the water-quality monitoring. Other projects associated with the Yambulla catchment have already been published, e.g. Connell and Ryan (2002) and Roberts, Vertessy, and Grayson (2001).

Documentation

Tantawangalo studies

- a) Journal article for Tantawangalo studies – Lane, P.N.J., Mackay, S.M. (2001). Streamflow response of mixed-species eucalypt forests to patch cutting and thinning treatments. *Forest Ecology and Management*, 143 131–142

Yambulla study

- b) O'Connell DA and Ryan PJ, (2002). Prediction of three key hydraulic properties in a soil survey of a small forested catchment, *Australian Journal of Soil Research*, 40: 191–206.
- c) Roberts S; Vertessy R; and Grayson R, (2001). Transpiration from *Eucalyptus sieberi* (L Johnson) forests of different age, *Forest Ecology and Management*, 143: 153–161.

Review conclusion

Tantawangalo – Concluded

Yambulla – Underway, will be completed after the results are analysed

Milestone 16

Eden RFA Attachment 5 Point 2(e)

New South Wales to publish the results from the Eden Burning Study

By the first five-yearly review

Progress of milestone

A research paper (Bridges 2005) containing the results of the Eden Burning Study was published in January 2005. It provides an overview of the Eden Burning Study results. Additionally, other supplementary reports have been produced relating to ecological impacts and sustainability of timber harvesting, fire patchiness and changes in understorey plant species richness (i.e. Binns and Bridges (2003), Penman *et al* (2007), Penman *et al* (2008a) and Penman *et al* (2008b).

Documentation

- a) The research paper Bridges RG (2005). 'Effects of logging and burning regimes on forest fuels in dry sclerophyll forests in south-eastern NSW, Initial results (1986–1993) from the Eden Burning Study Area: Research Paper No. 40' – Forests Resources Research, NSW Department of Primary Industries, Sydney, can be obtained at cost through the DPI Forests internet site: <http://www.dpi.nsw.gov.au/research/forestry>
- b) Binns DL and Bridges RG (2003). 'Ecological impacts and sustainability of timber harvesting and burning in coastal forests of the Eden area: Establishment and progress of the Eden Burning Study. Technical Paper 67', (Research and Development Division, State Forests of New South Wales: Sydney)
- c) Penman TD, Kavanagh RP, Binns DL, & Melick DR (2007). 'Patchiness of prescribed burns in dry sclerophyll eucalypt forests in south-eastern Australia', *Forest Ecology & Management*, 252:24–32.
- d) Penman TD, Binns DL, & Kavanagh RP (2008a). 'Quantifying successional changes in response to forest disturbances' *Applied Vegetation Science* 11: 261–268.
- e) Penman TD, Binns DL, Shiels RJ, Allen RM, & Kavanagh RP (2008b). 'Changes in understorey plant species richness following logging and prescribed burning in shrubby dry sclerophyll forests of south-eastern Australia' *Austral Ecology*, 33: 197–210.

Review conclusion

Completed

Milestone 17

North East RFA clause 33

Commonwealth to use its best endeavours to secure the enactment of legislation which amends the Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)

By 30 June 2000

Progress of milestone

The Australian Government enacted the *Regional Forest Agreements Act 2002* in May 2002. The Act defined forestry operations, RFAs and amended the relevant sections of the EPBC Act to reflect those definitions and to exempt forestry operations under the RFAs from the requirement for environmental approval under the EPBC Act.

Documentation

The EPBC Act can be found at:

<http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/current/bytitle/860D38D936708DEBCA25747B000EA31A?OpenDocument&mostrecent=1>

Review conclusion

Completed

4.7. Reserve management

Milestone 18

Eden RFA clause 46(b)

New South Wales to complete and publish plans of management for areas dedicated under the *National Parks and Wildlife Act 1974 (NSW)*

By 1 January 2002

North East RFA clause 48(c)

New South Wales to complete and publish plans of management for areas dedicated under the *National Parks and Wildlife Act 1974 (NSW)*.

By 1 January 2005

Southern RFA clause 47 (c)

New South Wales to complete and publish plans of management for areas dedicated under the *National Parks and Wildlife Act 1974 (NSW)*.

By 31 January 2006

Progress of milestone

Completion of management plans for areas dedicated under the NPW Act is continuing. Some management plans are yet to be prepared and, accordingly, did not meet the due date. In retrospect, the deadline was optimistic given the large number of reserves gazetted as a result of the RFAs.

Preparation of management plans require staff to familiarise themselves with a new park and to undertake liaison with the community before a plan is prepared. This process requires the public being invited to make comment on the plan, before the plan is adopted by the Minister for Climate

Change and the Environment. Subsequent additions of many disparate parks, particularly in the north east have added to the preparation workload.

However, plans are now being completed at a faster rate. For instance, as of 2008, preparation of nearly all plans in the Southern region have commenced and most are at the public exhibition or approval stage.

The quantity of plans does not represent the area of DECC reserves covered by plans. At March 2007, some 435 reserves⁷, covering over five million hectares and representing 87% of the reserve system by area, were covered by an adopted, or draft, plan of management.

As more parks are added each year, the preparation of the plan of management for a new park may be given priority over an existing park. Prioritisation for the preparation of management plans occurs on the basis of which parks are believed to have the highest threats to natural and cultural values. For example, priorities for completion of plans are given to parks that have high levels of public access, or major weed, pest or fire related concerns.

Where management plans are not in place, parks are managed in accordance with the NPW Act, and DECC statewide policies. Only limited activities can be conducted in these parks until a plan is prepared. Activities permitted include the erection of tenure signage, non-intrusive measures to protect cultural heritage items and small scale prescribed burns to protect neighbours and park assets.

Other activities, such as the upgrading or construction of tracks (not including emergency cases), construction of new visitor facilities or construction of new public infrastructure (such as telecommunications sites and water mains) are not permitted unless approved by a *Statement of Interim Management Intent* (SIMI). These statements document the intended departure (how and why) from interim management policy and set out a timeframe for the subsequent preparation of a plan of management. The statements are approved by the branch manager of field branches in DECC Parks and Wildlife Group, or the Deputy Director General.

Plans of management are prepared to ensure that:

- the requirements of the NPW Act are satisfied
- it is useful for guiding the management of the area, and
- it is consistent with other plans.

Comprehensive, Adequate and Representative (CAR) values (such as old-growth and rare or threatened flora and fauna species and ecological communities) are identified within plans. Plans of management also provide details of national estate values (such as wilderness, catchments, disjunct populations, centres of endemism, aesthetic values, cultural values and geological values) where relevant. Matters of national environmental significance, such as areas on the National Heritage List and any World Heritage or RAMSAR sites are also identified within the plans. Management actions to conserve all identified values are also contained within the management plans. Any plans containing nationally significant sites are referred to the Australian Government for comment prior to finalisation.

See discussion about fire management in milestone 27, section 4.12 and indicator 3.2, section 5.4 and other ecosystem health and vitality issues in criteria 3, section 5.4.

Management plans within Eden RFA

At 30 June 2008, there were 18 national parks, nature reserves, state conservation areas and historic sites within the Eden region requiring the preparation of management plans. Of these, 12 areas had management plans adopted by the NSW Minister for Climate Change and the Environment and are being implemented. A further draft plan was finalised (but yet to be adopted), three plans had been publicly exhibited, and two were in preparation.

⁷ Over the entire DECC reserves - not just RFA regions

Appendix 2a contains a list of parks and indicates the stage of the preparation of management plans for each park in the Eden region.

Management plans within North East RFA

As at 30 June 2008, there were 287 national parks, nature reserves, state conservation areas, historic sites, Aboriginal areas and regional parks in the North East region. Of these, 140 had management plans adopted by the NSW Minister for Climate Change and the Environment and are being implemented. A further 48 draft plans had been publicly exhibited, 19 plans were finalised (but not yet adopted) and another 39 were in preparation. The remaining 41 plans were yet to commence.

Appendix 2b contains a list of parks and indicates the stage of the preparation of management plans for each park in the North East region.

Management plans within Southern RFA

As at 30 of June 2008, there were 120 national parks, nature reserves, state conservation areas, historic sites, Aboriginal areas and regional parks in the Southern region. Of these, 39 have management plans adopted by the NSW Minister for Climate Change and the Environment and are being implemented. A further 48 draft plans have been publicly exhibited, 15 plans were finalised (but yet to be adopted) and another 11 were in preparation. The remaining seven plans were yet to commence.

Appendix 2 contains a list of parks and indicates the stage of the preparation of management plans for each park in the Southern region.

Documentation

- a) Details of current draft or final management plans can be viewed on the DECC website at: <http://www.environment.nsw.gov.au/parkmanagement/ParkAndFireManagementPlansByCategory.htm>
- b) Link to NPW Act: <http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Parks%20and%20Wildlife%20Act%201974%20No%2080%22&nohits=y>

Review conclusion

Underway (some complete, some draft and some still to do)

Milestone 19

Eden RFA Attachment 1 Point 4

New South Wales to prepare plans of management for Crown Reserves

By 1 January 2002

North East RFA Attachment 1A & Attachment 1 B Point 4

NSW to prepare Plans of Management for Crown Reserves

By 1 January 2005

Southern RFA Attachment 1 Point 4

NSW to prepare Plans of Management for Crown reserves

By 31 January 2006

Progress of milestone

A memorandum of understanding regarding the management of Crown reserves was signed 26 March 2001 between the Directors-General of NPWS (now DECC) and the Department of Mineral Resources.

The Crown reserve land-use category (under the *Crown Lands Act 1989*) was utilised through the NSW FA process. This is similar in intent to the state conservation area reserve category (established in 2002 under the NPW Act) which makes provision for mining and exploration activities, subject to these having regard to the conservation of the natural and cultural values of the area.

Initially management plans for Crown reserves were being prepared progressively pending clarification of legal issues. The time needed for resolution of these legal issues contributed to delays in the preparation of management plans, in addition to the reasons discussed under milestone 18 regarding the preparation of management plans for all parks.

Preparation of plans was subsequently deferred pending the completion of negotiations between NSW state agencies over the potential transfer of all Crown reserves to state conservation areas (SCAs). Such a transfer avoids duplication of land-use categories and solves some of the management anomalies that currently exist with Crown reserves that affect the preparation of management plans. The principal anomaly is that the legislation under which Crown reserves are established does not allow for the responsibility for the reserves (and, therefore, the management plans) to rest solely with the NSW Minister for Climate Change and the Environment.

During 2002–03 the one Crown reserve managed by DECC in the Eden region was reclassified as a state conservation area (Yurramie SCA) by the *National Park Estate (Reservations) Act 2002*. The plan of management for Yurramie SCA was part of the South East Forests draft plan of management (which had not been publicly exhibited at 30 June 2004), and is included in the figures reported for milestone 18. The SCA was subsequently excluded from the final plan for the South East Forests (adopted by the Minister for Climate Change and the Environment on 3 August 2006). A plan is yet to be prepared for the SCA.

During 2002–03 all 11 Crown reserves managed by DECC in the North East region (UNE and LNE regions) were reclassified as SCAs by the *National Park Estate (Reservations) Act 2002*. Reporting against completion of the management plans is included at milestone 18.

During 2002–03 all but six Crown reserves managed by DECC in the Southern region were reclassified as SCAs by the *National Park Estate (Reservations) Act 2002*. At 30 June 2003, no management plans for the remaining Crown reserves had commenced but general park management was being undertaken within available resources, e.g. fire, pest and weed management. Plans of management for SCAs are being prepared progressively and reported against milestone 18.

On 1 April 2005, four of the remaining six Crown reserves in the Southern region were reclassified as SCAs by notice in the *Government Gazette Week No. 13/2005* (p. 1014). Plans of management for SCAs are reported against milestone 18.

Recategorisation of the remaining two Crown reserves as SCAs – Mullengandra and Woomargama (both in the Tumut subregion) – are pending resolution of issues regarding the inclusion/exclusion of roads in the reserves. In the interim, draft management plans have been prepared for these two reserves and are awaiting adoption (pending this resolution).

Documentation

- a) *National Park Estate (Reservations) Act 2002* can be found at:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202002%20No%20137%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202002%20No%20137%22&nohits=y)
- b) *Government Gazette Week No. 13/2005* (Friday 1 April 2005) is located at:
http://www.advertising.nswp.commerce.nsw.gov.au/NR/rdonlyres/esetevboqiszrc5ufrh3mb1mzbtajk6ovqugibps2iuwh4qj5zpsy6ef3y3d6cssiqubnmihybaiok/1st_April.pdf
- c) Details of current draft or final management plans can be viewed on the DECC website:
<http://www.environment.nsw.gov.au/parkmanagement/ParkAndFireManagementPlansByCategory.htm>

Review conclusion

Concluded

Milestone 20

Eden RFA Attachment 5 Point 1(p) New South Wales to publish a State of Parks report By April 2000
North East RFA Attachment 6 1(p) New South Wales to publish a State of Parks report By April 2001
Southern RFA Attachment 6 Point 1(o) New South Wales to publish a State of Parks report By 31 August 2001

Progress of milestone

The *State of the Parks* is an ongoing program.

The first *State of the Parks* report was released in November 2001. The report provided a snapshot of the conservation values in NSW and their management within the parks system. This was supported by a series of case studies for parks around the state. Indicators are being developed by which DECC PWG management effectiveness will be reported in future *State of the Parks* reports.

The second *State of the Parks* qualitative survey was run in late 2004 with a public report released in June 2005. This report examined key issues for management within NSW parks and included data on the effectiveness of park management and was based on an International Union for the Conservation of Nature (IUCN) international management framework.

A further *State of the Parks* survey was undertaken in 2005 to establish a baseline for future surveys. The opportunity was also taken to develop the survey as an online tool to ease data access and entry. Considerable enhancements were made to the survey methodology to standardise data collection. More comprehensive training and guidelines were also developed.

Achievement of the milestone was delayed because it was the first report for NSW, and one of the first to be developed in Australia. Its development was an iterative process that took longer than expected.

Documentation

The 2001 and 2004 *State of the Parks* reports can be viewed on the DECC website at: <http://www.environment.nsw.gov.au/sop/index.htm>

Review conclusion

Completed

4.8. CAR reserve system

Milestone 21

Eden RFA Attachment 1 Point 7

North East RFA Attachment 1A Point 8 & Attachment 1B Point 12

New South Wales to establish all Dedicated Reserve and Informal Reserve components of the CAR Reserve System.

Within six months of signing

North East RFA Attachment 1 A Point 5

NSW will finalise boundaries of CAR reserve to enable implementation.

Within six months of signing

Southern RFA Attachment 1 Point 5

NSW will finalise boundaries of CAR reserve with the exception of the Forest Management Zoning System.

By 30 June 2001

Southern RFA Attachment 1 Point 8

New South Wales to establish all Dedicated Reserve components of the CAR Reserve System.

By 30 June 2001

Southern RFA – clause Attachment 1 Point 8

New South Wales to establish all Informal Reserve components of the CAR Reserve System.

By 31 December 2001

Progress of milestone

Beside existing reserves which form part of the CAR reserve system, additional national parks, nature reserves, Crown reserves and flora reserves have been created by the FNPE Act for the Eden and North East regions (assented on 14 December 1998). The FNPE Act provided 138,128 hectares of reserves in the UNE region, 246,515 hectares in the LNE region, and 35,463 hectares in the Eden region.

Forestry Management Zone (FMZ) 2 areas on Forests NSW forest estate in the Eden and North East regions were finalised in the NSW FA for the Eden region, NSW FA for the LNE region and NSW FA for the UNE region in March 1999.

In the Southern region, beside existing reserves, additional dedicated and informal reserve components were established with the passage of the *National Park Estate (Southern Region Reservations) Act 2000* (NPESRR Act) on 13 December 2000, and adjusted by gazettal notice in March 2001. This provided 282,273 hectares of DECC reserves in the Southern region. The NPESRR Act also established seven new flora reserves on state forest. These are in addition to flora reserves already established. FMZ 2 areas on Forests NSW forest estate were finalised with the NSW FA for the Southern region in May 2002.

Crown Reserves created by the FNPE Act were transferred to SCAs in the *National Park Estate (Reservations) Act 2002* (with some exceptions – see discussion at milestone 19).

A discussion on the management plans for the reserves in the CAR reserve system are contained in section 4.7 – milestone 18 and appendix 2. For a discussion on FMZs see section 4.15 – milestone 37. Further details on additions to the CAR reserve are included in section 3.4 and section 5.2 – indicator 1.1.a.

Documentation

- a) The FNPE Act at:
<http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Forestry%20and%20National%20Park%20Estate%20Act%201998%20No%20163%22&nohits=y>
- b) NPESRR Act at:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Southern%20Region%20Reservations\)%20Act%202000%20No%20103%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Southern%20Region%20Reservations)%20Act%202000%20No%20103%22&nohits=y)
- c) *National Park Estate (Reservations) Act 2002* at:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202002%20No%20137%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202002%20No%20137%22&nohits=y)

Review conclusion

Completed

4.9. Threatened species management

Milestone 22

North East Attachment 3 point 4

NSW will complete the Threat Abatement Plan for the European red fox.

By July 2000

Southern RFA Attachment 3 point 4

NSW will complete the Threat Abatement Plan for the European red fox.

By 31 December 2001

Progress of milestone

Threat abatement planning is a key element in the approach to threatened species management.

The NSW Threat Abatement Plan for the European Red Fox was approved by the NSW Minister for Climate Change and the Environment in December 2001.

The Australian Government Threat Abatement Plan for the European Red Fox was approved on 2 July 1999.

For more information on threatened species management see section 5.2 – indicator 1.2.b and 1.3.

Documentation

- a) NSW Threat Abatement Plan for the European red fox can be viewed on DECC website:
<http://www.environment.nsw.gov.au/threatenedspecies/RedFox-FinalThreatAbatementPlan.htm>
- b) Also see further detail on predation by the European red fox as a key threatening processes on the DECC website at:
<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=20015>
- c) Also see further detail on threatened species management on the DECC website at:
<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/index.aspx>
- d) The Australian Government Threat Abatement Plan for Predation by the European Red Fox can be viewed on the following website:
<http://www.comlaw.gov.au/ComLaw/legislation/legislativeinstrument1.nsf/all%5Cwhatsnewbackcapture/127CA8BE87A353C3CA25739C001F79AD?OpenDocument>

Review conclusion

Completed

Milestone 23

Eden Attachment 2 Table 1

Southern RFA Attachment 3 Table 1

New South Wales to develop recovery plans for species listed in Table 1

Within five years of signing

North East RFA Attachment 3 Table 1

New South Wales to develop recovery plans for species listed in Table 1 of Attachment 3

Within five years of signing

Progress of milestone

NSW processes

Initially, recovery plans were being prepared for each of the species listed in the RFAs. However the NSW statutory requirement for the preparation of threatened species recovery plans was changed in 2005. Rather than recovery plans being obligatory for each threatened species, the *NSW Threatened Species Legislation Amendment Act 2004* established a requirement to prepare a Priorities Action Statement (PAS).

The PAS sets out the strategies (recovery and threat abatement strategies) to be adopted for promoting the recovery of each threatened species, population and ecological community to a position of viability in nature.

The PAS establishes a framework for the development of relative priorities and recovery actions to allow for the implementation of these strategies. Among the possible strategies listed within the PAS is recovery planning or threat abatement planning. DECC has, however, determined that recovery plans will not be required for all the threatened species listed within RFAs. The PAS sets out timetables for the preparation of recovery plans for the threatened species that will require a specific recovery, or threat abatement plan. Recovery plans will only be developed for species where they are iconic, have complex conservation issues and require agreement from multiple stakeholders.

The PAS works in conjunction with existing recovery plans and programs. It does not supersede or replace existing programs; rather it provides a broader framework for those programs. The PAS was placed on public exhibition in early 2006 and was adopted by the Director General of DECC in October 2007. It will be reviewed every three years, with the first review scheduled for 2010.

In summary, by the end of June 2008:

- the preparation of seven of the 25 recovery plans listed in the Eden RFA was underway. Seven plans were approved and implemented, seven plans were complete drafts or had been exhibited, and 4 plans were replaced with PAS.
- the preparation of 26 of the 156 recovery plans listed in the North East RFA was underway. Thirty-two plans were approved and implemented, 11 were complete drafts or had been exhibited, seven not started and 80 plans were replaced with PAS.
- the preparation of 26 of the 121 recovery plans listed in the Southern RFA was underway. Eighteen plans were approved and implemented, 13 were complete drafts or had been exhibited, and 64 plans were replaced with PAS.

For more information on threatened species management see section 5.2 – indicator 1.3.

Australian Government processes

The Australian Government legislative mechanism for national environment protection and biodiversity conservation is the EPBC Act. The EPBC Act provides for, among other things, identification, listing, protection and recovery of threatened species and ecological communities.

The decision to list an ecological community or species is made by the Australian Minister for the Environment, Heritage and the Arts after a rigorous process that involves consultation with stakeholders and advice from the Threatened Species Scientific Committee (TSSC). The TSSC is an independent scientific body that advises the Minister on the conservation status of native species and ecological communities.

In 2006, amendments to the EPBC Act removed the requirement to have a recovery plan prepared for every listed species, replacing it with a requirement for the provision of a conservation advice and the option for the Minister to develop a recovery plan, having regard to the advice of the TSSC. Therefore, not all EPBC listed species will have recovery plans prepared. Where there is no recovery plan in place or in preparation, a conservation advice will be prepared by the end of 2008.

All species and ecological communities that had a recovery plan in preparation prior to the amendments to the EPBC Act will continue to have the plan finalised unless the Minister decides otherwise.

It should be noted that the process for listing threatened species and ecological communities under the EPBC Act and the way in which ecological communities are defined under the Act have changed in recent years. Previous ecological community definitions did not take into account the impact of degradation. Definitions of newly listed ecological communities now account for degradation by the use of condition classes. A condition class describes areas of an ecological community that have a similar conservation value and can be determined by factors such as: numbers and types of native plants and animals present, the level of weed invasion, the size of the area and the distance to the next area of native vegetation. Significantly degraded (low condition) areas do not form part of a listed ecological community.

For example, the littoral rainforest and coastal vine thickets ecological community of eastern Australia was recently listed as critically endangered under the EPBC Act. The ecological community is typically found within two kilometres of the sea from Princess Charlotte Bay at the southern end of Cape York Peninsula in Queensland to the Gippsland Lakes in Victoria. Patches of the ecological community are known to occur in NSW RFA areas. Some consideration will need to be given to the condition thresholds that determine what forms of the listed community will need to be applied.

Since signing of the NSW RFAs, a number of species and ecological communities in RFA areas have been listed under the EPBC Act. While recovery plans and listing processes are being implemented for forest species throughout NSW, the EPBC Act does not apply to forestry operations in RFA regions where those operations are in accordance with an RFA. The NSW RFAs provide for environmental protection in respect of forestry operations through management prescriptions and the CAR reserve system. The NSW Government is responsible for the management of on-ground forestry operations consistent with its commitments in the RFA. For example, 'the parties agree that the management prescriptions or actions identified in jointly prepared and agreed Recovery Plans or Threat Abatement Plans will be implemented as a matter of priority, including through the IFOA on State forest' (e.g. clause 61 Southern RFA).

As examples of recovery plan processes, regarding clause 60 of the Eden RFA, a recovery plan prepared by Victoria for the long-footed potoroo was adopted as a national recovery plan for the species in March 2001. The Australian Government has contracted Victoria to revise the plan.

The Australian Government has also funded the development of a national recovery plan for the Border Ranges biodiversity hotspot region, which comprises part of the North East RFA region. While currently in draft form, the plan will identify actions to protect a number of EPBC-listed threatened species, including some listed in table 1 of the North East RFA. Australian Government funding has been provided for implementation of actions identified in the draft plan.

Appendix 3 provides details on the status of recovery plans and the relevance of PAS actions for the species listed in the RFAs (e.g. table 1 of attachment 3 of the Southern RFA) and of those that are required by Australian Government processes.

Documentation

- a) NSW recovery plans can be viewed on the DECC website:
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/pas_recovery_strategies_details.aspx?heading=recovery+plan+preparation
- b) For more detail on threatened species and recovery planning in NSW, see:
<http://www.environment.nsw.gov.au/threatenedspecies/index.htm> and
<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/index.aspx>
- c) Australian Government recovery plans can be viewed at:
<http://www.environment.gov.au/biodiversity/threatened/recovery.html>
- d) General information about the Australian Government threatened species and ecological communities listing process can be accessed at:
<http://www.environment.gov.au/epbc/protect/species-communities.html>
- e) Information about Australian Government listed ecological communities (including the littoral rainforest ecological community) e.g. community description, condition thresholds and known threats can be accessed at: <http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>
- f) DEC 2003–04 annual report pp. 32–3
<http://www.environment.nsw.gov.au/whoweare/decannualreport0304.htm>
- g) DEC annual report 2004–05, pp. 34, 37–38.
<http://www.environment.nsw.gov.au/whoweare/decar05.htm>
- h) DEC annual report 2005–06, pp. 49, 52 see:
<http://www.environment.nsw.gov.au/whoweare/decar06.htm>

Review conclusion

Underway. Some done, others in draft, some still to do or have been replaced by PAS or conservation advices.

4.10. Cultural heritage values

Milestone 24

Eden RFA Attachment 3 Point 8

Both parties to finalise Statewide Guidelines for the Management of Cultural Heritage Values and Places

End of 1999

Progress of milestone

Statewide Guidelines for the Management of Cultural Heritage Values and Places were contained in the reports titled 'Protective Mechanisms for Cultural Heritage – Generic Version', 'Protective Mechanisms for Cultural Heritage – LNE Region' and 'Protective Mechanisms for Cultural Heritage – Southern Region'. These reports were developed by both parties in the comprehensive regional assessment (CRA) process by the Cultural Heritage Working Group. The Australian Government has reviewed these reports and considers they are sufficiently consistent to be considered statewide guidelines.

Cultural values are also managed according to DECC legislative responsibilities and existing statewide policies and guidelines. These include a Cultural Heritage Strategic Policy, Consultation Policy, Cultural Heritage Information Policy and Guidelines for the Assessment of Impact on Heritage Places. These DECC policies are consistent with the aforementioned reports and are periodically reviewed.

Forests NSW heritage guidelines were developed with reference to the above reports and are attached to the IFOAs for the UNE, LNE, Eden and Southern regions. The guidelines describe planning, operation, monitoring and review processes for managing cultural heritage.

For additional information on the management of cultural heritage see section 5.7 – indicators 6.4.c and 6.6.

Documentation

CRA reports

- a) For the CRA reports see: <http://www.daff.gov.au/rfa/publications/cra-state>

DECC

- b) For further information on DECC's role in cultural heritage see:
<http://www.environment.nsw.gov.au/cultureandheritage.htm>

Forests NSW

- c) For the cultural heritage guidelines attached to the IFOA see:
<http://www.environment.nsw.gov.au/resources/forestagreements/CulturalHeritageGuide.pdf>

Review conclusion

Completed

Milestone 25

Southern RFA clause Attachment 4 point 14

NSW will identify and assess cultural heritage values in areas excluded from CRA assessments.

By 31 December 2001

Progress of milestone

In regard to the two small areas that were excluded in the Southern region, local councils have undertaken historic heritage assessments including:

- North West of Holbrook – Wagga Wagga City Council undertook a rural heritage study in 2000 that covers the area.
- Near Moss Vale – Wingecarribee Shire undertook a heritage study in 1990 and has a list of heritage items in schedule 2 of Wingecarribee Shire Local Environmental Plan 1989. The Wingecarribee Heritage Survey is being reviewed on behalf of the council by consultants primarily to identify further items of heritage significance. The review consists of fieldwork to properly identify, document and photograph items and historical research of newly identified items and other relevant contemporary historical data.

Documentation

- a) Wagga Wagga City Council: <http://www.wagga.nsw.gov.au>
- b) Wagga Wagga City Council Rural Heritage Study (2000)
Volume 1: The Study (September 2000)
Volume 2: Inventory Parts 1, 2, 3 & 4 (August 2000)
Author: Peter Freeman Pty Ltd – Conservation Architects/Planner – Canberra. In association with Ms Sherry Morris – Historian – Wagga Wagga and Ms Angharad Dean – Planning – Canberra
- c) Wingecarribee Shire:
<http://www.legislation.nsw.gov.au/viewtop/inforce/epi+17+1990+FIRST+0+N/>
- d) Schedule 2 of Wingecarribee Shire Local Environmental Plan 1989 (see <http://www.legislation.nsw.gov.au/viewtop/inforce/epi+17+1990+FIRST+0+N/>) lists the items of
- e) JRC Planning Services (1990) 'Wingecarribee Heritage Study' unpublished (held at Wingecarribee Shire Council).
- f) The State Heritage Inventory can be accessed online at http://www.heritage.nsw.gov.au/07_subnav_04.cfm

Review conclusion

Concluded

4.11. Environmental management systems

Milestone 26

Eden RFA clause 46(h)

New South Wales to develop and implement environmental management systems

Within five years of signing

North East RFA clause 48(h)

New South Wales to develop and implement environmental management systems

Within five years of signing

North East RFA Attachment 8 1(a)

NSW NPWS will develop an environmental management system for lands dedicated under the NPWS Act 1974.

By April 2004

North East RFA Attachment 8 1(b)

SFNSW to develop a native forest management system as an environmental management system

By 1 April 2001

Southern RFA – clause 47 (h)

New South Wales to develop and implement environmental management systems

By 30 April 2004

Southern RFA Attachment 8 Point 2 (b)

NSW NPWS will develop an environmental management system for lands dedicated under the NPWS Act 1974.

By 30 April 2004

Southern RFA Attachment 8 Point 2 (c)

SFNSW develop a native forest management system as an environmental management system.

By 30 April 2001

Progress of milestone

DECC

An environmental management system for park management is being delivered through the Park Management Program (PMP). The program is intended to cover all areas of DECC on-park operations. It will define DECC values and objectives for park management, and integrate park policy, planning, operations, monitoring, evaluation, reporting and feedback. The program provides the tools to make better decisions and to improve coordination across DECC by making it easier for staff to access information to guide their park management decisions and allow adaptive management. The program is helping to improve the way DECC goes about its park management by:

- providing clear, consistent management objectives and operational procedures
- introducing an integrated system to achieve consistent standards in park management and improve DECC's ability to demonstrate and report on performance, and
- providing a mechanism which improves the coordination of information across DECC to make it easier for staff to access information to guide park management.

The PMP will promote a consistent whole-of-NSW approach to park management and provide for the transfer of good ideas for improvement in the management of parks across DECC park branches and regions. The PMP will link and build on existing DECC processes and achievements. Both new and existing initiatives will be included such as the:

- State of the Parks program;
- Asset Maintenance System
- *Park Management Policy Manual*
- *Park Facilities Manual*
- *Park Operation Procedures Manual*
- *Fire Management Manual*, and
- Levels of Service project.

It will also include park-planning processes at a range of scales such as branch visitation management plans and plans of management.

The PMP is a highly detailed and multi-faceted program encompassing all work areas of the DECC Parks and Wildlife Group as well as many interactions with other sections of DECC. The complexity and scale of the project has meant that some PMP components are still being developed. In 2006 a steering committee was established to develop and implement the Park Management Program Framework – a strategy for integrating the various components – and has overseen the finalisation and rollout of a number of them. Work on the PMP and its components is ongoing and some of it is described below.

The *Park Management Policy Manual* is a single electronic document that provides summaries and linkages to all relevant documents (DECC and others) related to park management. It is regularly updated to ensure accurate information is available to staff. In June 2006 the manual was in final draft form prior to a final consultation phase with staff and the National Parks and Wildlife Advisory Council. The document is now an active online resource available to staff through the department's intranet.

A companion document is the *Park Operating Procedures Manual* which aims to provide consistent and high-quality procedural guidance to staff. It achieves this by serving as a central node that brings together adopted DECC procedural documents as well as documents from other sources with useful advice on procedural best practice. The development of this manual commenced in 2007 and is currently in draft form.

The *Park Facilities Manual* provides a set of planning and design guidelines that implement excellence in sustainable management of visitor facilities. It helps to ensure facilities across DECC parks are increasingly standardised. The manual provides a coordinated set of standards applicable to parks across NSW developed from principles established and trialled under the *Guidelines for Park Facilities* (1985) and the *Northern Branch Draft Facilities Manual* (2004). The *Park Facilities Manual* was released in December 2007.

State of the Parks is a program that seeks to monitor and evaluate the condition of and pressures on NSW parks, and seek to ascertain how effectively these areas are being managed. The NSW State of the Parks program is the largest and most comprehensive of its type in the world with the information being used to assist in operational planning within NSW national parks as well as assisting a variety of reporting needs. After a preliminary report in 2001, State of the Parks was implemented in early 2004 with the first full public report released in 2005. Further review,

refinement and system development has been undertaken since with subsequent assessments in 2005 and 2007 (see milestone 20).

The Asset Maintenance System provides a comprehensive inventory of all assets owned and/or maintained within DECC reserves and is a tool for consistent and efficient scheduling and implementation of asset maintenance. This system is a major information source for determining long-term asset strategies and will assist in DECC's ongoing minor works requirements. It has been under development for a number of years and in 2006 underwent a review to address issues raised in field trials and to enable linkage of the system to the PMP. The system was fully implemented in 2008.

Levels of Service is a project that aims to identify the outcomes, or standards, planned for each DECC reserve relating to natural and cultural heritage values, and recreational opportunities. The project will categorise parks to derive relative priorities based on park characteristics, basic management needs and standards of service. A contractor was appointed to develop this project under the guidance of a technical working group in 2006. A report was produced and a trial rollout has been approved to test the proposed model at a regional scale.

DECC undertakes planning at a range of scales to achieve its park management objectives. A park planning guide is under development as part of the PMP so that plans can be structured under an agreed hierarchy to ensure consistency and accuracy. A consultant was engaged during 2006 to review planning across the parks system. The outcomes of the review are being considered in the development of the park planning guide. To date, the emphasis has been on developing specific planning capabilities at different scales.

The *Fire Management Manual*, for example, brings together the policy and procedural information necessary for DECC to achieve its fire management objectives across the state. The manual provides guidelines for staff and strengthens the organisation's ability to work cooperatively with other fire authorities, emergency services and the community. The manual was published in 1990, first revised in 2001, and revised annually since then.

DECC has also developed branch visitor management plans (BVMP) as a key action under the *Living Parks – Sustainable Visitation Strategy* (2006). The plans identify initiatives that will enhance visitor opportunities and regional tourism in the short to medium term, building on recent achievements that provide the model for similar future projects in appropriate localities. They will be used to determine where DECC invests future funds and for seeking opportunities to engage with the private sector. These plans are being finalised.

A *Plan of Management Manual* was released in 2003 and is regularly updated. The manual provides a template and guidance to the planning process for DECC to follow during the development of park-specific management plans.

Forests NSW

The Forests NSW environmental management system (EMS) provides for continuous improvement in environmental management in native and planted forests. The EMS is a comprehensive planning, assessment, implementation, monitoring, auditing and reporting system.

Initially Forests NSW placed a draft native forest management system on public display in September 2000 with draft regional ESFM plans. The system has been renamed the Native Forest Environmental Management System to better highlight the intent of the system.

Following the public display of the Native Forest Strategic Framework in September 2000 and a gap analysis by an external ISO 14001:2004 certification company, the Native Forest Environmental Management System was rolled out to all native forest regions. Simulated EMS audits followed and audit outcomes have been used to further improve the system.

As a result of these audits, Forests NSW identified areas of business that needed further improvement, including:

- implementation of a corporate document control system
- maintenance of training records including training matrices to determine future training needs
- standardised road and harvest maps
- management of occupation permits areas
- safety issues
- the need to update corporate systems and management documents
- application of corporate environmental systems, and
- ensuring consistency in the regional standards of environmental controls.

A key area is the corporate non-conformance reporting and tracking system, which was developed to comply with the ISO 14001:2004 standard, and to provide a standard tool for assisting in the delivery of ESFM. Regional ESFM plans and associated supplementary plans, which form a component of Forests NSW EMS, were developed (see milestone 36).

Although the intention was to develop the EMS for native forest only, Forests NSW included the planted estate. During 2003–04 a draft procedures EMS manual was developed, specifically addressing native forest issues but options for its appropriateness for planted forests were considered.

In 2004–05 senior management of Forests NSW approved an audit program for native forest regions to assess the workings of its environmental management systems. Auditing in plantation areas was confined to compliance with the environment protection licence and codes of practice during this period.

During 2005–06, Forests NSW completed its review and implemented recommendations from internal audits of 2004–05. The findings of these reports formed the basis for the external verifiers to assess the Forests NSW EMS systems.

Forests NSW finalised a number of corporate systems and management reviews to obtain its external certification in ISO 14001:2004 (EMS) in June 2006. The ISO 14001:2004 certification covers both native and plantation operations.

Completion of the EMS has taken longer than expected due to the size of the task. A typical EMS addresses potential environmental impacts caused by corporate business activities, usually at a limited number of sites with few variables between sites. Simply creating a typical EMS framework within the Forests NSW business would not achieve ISO 14001:2004 nor RFA objectives due to the large and diverse nature of the organisation and its activities. Forests NSW has had to implement an EMS across three operational divisions including nine management regions and 12 offices to address activities relevant to forest management planning, harvesting, monitoring and reporting for over two million hectares of native forest and half a million hectares of planted forests. Successful completion and integration of an EMS into Forests NSW business has occurred gradually through extensive consultation with divisions and regions to identify their needs, and through ongoing staff education and promotion of the system.

In addition, Forests NSW considered the ramifications of certifying its forest area through one of two international certifying systems – Australian Forest Standard or Forestry Stewardship Council. These systems work either better with native forest or plantation and currently management is considering which system is best for both areas of Forests NSW business.

In December 2006 Forests NSW was certified as compliant with the Australian Forestry Standard (AFS) (AS 4708 (int) 2003) by NCS International.

The AFS complements the pre-existing regulatory structure and EMS with an independent perspective. Regular external audits carried out by NCS International assess not only Forests NSW management systems and compliance with applicable licenses, but also their commitment to sustainable timber supply, efficient resource use, stakeholder involvement, staff training, carbon

sequestration, and other ESFM aspects. Regular assessment and guidance by the AFS has helped Forests NSW continually improve its practices and allowed the organisation to be a responsible forest custodian.

Documentation

DECC

- a) The 2001 and 2004 *State of the Parks* reports can be viewed on the DECC website at: <http://www.environment.nsw.gov.au/sop/index.htm>

Forests NSW

- b) Forests NSW (2008a) Australian Forestry Standard and Environmental Management System Manual, Forests NSW, Sydney at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- c) Forests NSW *Seeing* Report 2003–04 p. 12, may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- d) Forests NSW 2003–04 Annual Report pp. 6 and 48, may be viewed on the DPI website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- e) Forests NSW *Seeing* Report 2005–06 p. 17, may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>

Review conclusion

DECC – underway

Forests NSW – completed

4.12. Integrated control programs for bushfires, feral animals and weeds

Milestone 27

Eden RFA Attachment 7 Point 12

New South Wales to incorporate codes of practice that address bush and other fires within Regional ESFM Plans and plans of management for areas dedicated under the *National Parks and Wildlife Act 1974* (NSW)

By the first five-yearly review

North East RFA Attachment 8 1(l)

New South Wales to incorporate codes of practice that address in an integrated fashion bush and other fires within Regional ESFM Plans and plans of management for areas dedicated under the *National Parks and Wildlife Act 1974* (NSW).

By the first five-yearly review

Southern RFA Attachment 8 Point 2(l)

New South Wales to incorporate provisions that address in an integrated fashion bush and other fires within Regional ESFM Plans and plans of management for areas dedicated under the *National Parks and Wildlife Act 1974* (NSW).

By the first five-yearly review

Progress of milestone

DECC and Forests NSW ensure that an integrated approach to fire management (including prevention, mitigation and suppression) is achieved at a state level through their participation in the

NSW Bush Fire Coordinating Committee, which is established by the NSW *Rural Fires Act 1997* (RF Act). The committee is responsible for statewide planning in relation to bushfire prevention and coordinated bushfire fighting, and for advising the NSW Rural Fire Service Commissioner on bushfire prevention, mitigation and coordinated bushfire suppression.

District bush fire management committees are responsible for implementing Bush Fire Coordinating Committee policy at the local level in a collaborative way with other constituent members. The committees provide a forum for cooperative and coordinated fire and fuel management and community involvement. They are responsible for the completion of bushfire risk management plans and an operations coordination plan. These plans are approved by the Commissioner for the NSW Rural Fire Service following consideration of a variety of landscape values. Both Forests NSW, DECC and other land managers are represented on the committees and have statutory obligations for fire management under the RF Act.

The Bushfire Risk Management Plan is a strategic plan that encompasses all land tenures including private lands, DECC reserves and state forest areas on a local government basis. The plan identifies community, environmental, cultural and economic assets at risk from fire, provides strategies to mitigate the risk at the landscape level, and sets out a five-year program to mitigate these risks. It is implemented via an annual works program.

The operations coordination plan contains information about staff contact details for all fire agencies as well as relevant community organisations and resources that are available for fire suppression activities. These plans also contain maps of the district bush fire management committee area as well as details of fire roads, fire lookout towers and other fire-related infrastructure.

The Rural Fire Service undertakes periodic audits of annual works programs as part of its monitoring process to gauge compliance with the bushfire risk management plan.

Given the dispersed and fragmented nature of lands managed by both Forests NSW and DECC across the landscape, suppression of fires often necessitates a cooperative approach by all fire authorities and results in integration of resources, fire and local knowledge and the sharing of suppression costs.

Full integration of fire suppression activities is achieved during fires that are declared as fire emergencies pursuant to section 44 of the RF Act. Following a declaration, fires are managed at the landscape level across all tenures with the Rural Fires Service Commissioner taking charge of all fire operations and the resources of all government agencies involved in the suppression effort.

Section 5.4 – indicator 3.2, provides additional information on fire management and the impact of fire on forest ecosystems in NSW.

DECC

DECC addresses bushfire management in several ways:

- DECC fire management plans for its reserves are consistent with bushfire risk management plans but have a greater level of detail. These are prepared for reserves where such detail is necessary and a specific document is required. Such plans are subject to extensive public consultation and are considered by the district bush fire management committees.
- Where this level of detail is not required, provisions are incorporated directly into management plans for reserves.
- ESFM principles are incorporated into bushfire risk management plans and reserve fire management plans (prepared at the individual reserve level). These address the provisions outlined, and are important for risk management, threatened species management and recovery planning.

Forests NSW

As a planning tool for managing fuels across its forest estate, Forests NSW developed annual interim fuel management programs while formal fuel management plans were being compiled.

Forests NSW subsequently approved the Corporate Fuel Management Plan in February 2008 and the Model Regional Fuel Management Plan in August 2008.

The Corporate Fuel Management Plan sets the standards and strategic framework for fuel management across all lands managed by Forests NSW. The Model Regional Fuel Management Plan provides a template for documenting planned fuel management activities at the regional level in accordance with principles outlined in the Corporate Fuel Management Plan. These plans facilitate Forests NSW integration into and development of the operations coordination plans and bushfire risk management plans of the district bush fire management committees.

An operational burning plan template has been developed as a tool for implementing each fuel management operation in the field and contains a description of the area to be treated, boundaries of the proposed activity and guidelines for conditions under which the activity should be implemented. This template is currently being reviewed.

Implementation of the operational burning plan often involves cooperative arrangements with other land managers as well as integration of planning effort and resources on the day.

ESFM plans were approved in 2005 for the UNE, LNE Eden and Southern regions and identify Forests NSW fire management commitments (see milestone 36).

All Forests NSW regions have integrated their relevant fire suppression contracts and resources information into the operations coordination plans within their respective district bush fire management committees.

Each Forests NSW region is developing a comprehensive fire management plan that will address the strategic protection of assets. At present the information pertinent to such a plan is available in various documents held by the organisation.

Documentation

Rural Fire Service

- a) NSW Rural Fire Service see: <http://www.bushfire.nsw.gov.au/>
- b) RF Act see:
<http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Rural%20Fires%20Act%201997%20No%2065%22&nohits=y>

DECC

- c) Details of DECC draft or final fire management plans can be viewed on the DECC website at:
<http://www.environment.nsw.gov.au/parkmanagement/ParkAndFireManagementPlansByCategory.htm>
- d) DEC 2003–04 annual report pp. 45–46 see:
<http://www.environment.nsw.gov.au/whoweare/DECAAnnualReport0304.htm>
- e) DEC annual report 2004/05 pp. 53–54 see:
<http://www.environment.nsw.gov.au/resources/decar05fullreport05428.pdf>
- f) DECC annual reports see:
<http://www.environment.nsw.gov.au/whoweare/reports.htm>

Forests NSW

- g) 1999–2000 Forests NSW Environmental and Social Values Report pp. 22 – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- h) 2000–01 Forests NSW Social, Environmental and Economic Report p 36 – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>

- i) 2001–02 Forests NSW Social, Environmental and Economic Report pp. 34, 36–37 – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- j) 2002–03 Forests NSW Social, Environmental and Economic Report p 36 – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- k) 2003–04 Forests NSW Social, Environmental and Economic Report pp. 8 & 20 may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- l) 2004–05 Forests NSW Social, Environmental and Economic Report p 32, is available at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- m) 2005–06 Forests NSW Social, Environmental and Economic Report pp. 10, 21 & 28 – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- n) Forests NSW, (2008b) Corporate Fuel Management Plan, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- o) Forests NSW, (2008c) Model Regional Fuel Management Plan, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- p) Forests NSW, (2008d) West Pennant Hills Region HRB Operational Plan 02/07, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

Completed

Milestone 28

North East RFA Attachment 8 1(m)

Southern RFA Attachment 8 Point 2 (m)

New South Wales to incorporate within the Regional ESFM plans and plans of management under the NPW Act 1974 integrated feral animal ... programs

By the first five-year review

Progress of milestone

Forests NSW

Pest animal management is integrated into Forests NSW ESFM plans published in 2005. Supplementary pest animal management plans have been produced for each region covering the period 2006–11. The supplementary plans contain details of the objectives, strategies, actions and cooperative arrangements with other government agencies, land managers and neighbouring landowners, for the control of priority pest animals. Forests NSW regions produce annual pest animal management programs, in close cooperation with stakeholders, to maximise program delivery across the landscape. Development of the programs, and their integration with the programs of other parties, takes place through meetings and correspondence. See details below on various programs within the regions.

DECC

The main pest animal management priorities for the conservation of biodiversity undertaken by DECC are focused on threatened species and endangered ecological communities. Pest animal management programs are identified and prioritised in DECC regional pest management strategies and integrated into the NSW Threatened Species Priorities Action Statement, threat abatement plans, recovery plans and reserve management plans. Pest animal programs are also integrated with other park management programs such as fire management. Refer to specific milestones regarding the preparation of management plans (milestone 18) and recovery plans (milestone 23).

DECC reserve management plans identify priority pest animal problems and the need for actions which are in turn addressed by statewide threat abatement plans or regional pest management strategies. Regional pest management strategies outline objectives and strategies for managing priority pest animals across DECC reserves, aim to maximise the effectiveness of pest control programs, and outline how DECC will cooperatively manage pest issues across the landscape with other state government land management agencies, local government, rural lands protection boards, landowners and community groups.

DECC supports long-running cooperative programs with a variety of landholders, land management agencies and interest groups for the management of pest animals (e.g. foxes, wild dogs, feral horses, pigs and deer) and forest health (e.g. bell miner associated dieback). Regional pest management strategies were in place for all DECC regions by June 2006. New strategies were drafted for the period 2008–11, put on public display from late 2007 to early 2008, and have since been published. The DECC website presents a range of information on agency pest and forest health programs.

UNE/LNE The bell miner associated dieback (BMAD) strategy is being implemented in a partnership between DECC, Forests NSW, other government agencies and stakeholders. Two large-scale adaptive management trials using fire as a management tool are underway this year, and a major research investigation aimed at unravelling factors that may contribute to BMAD will be completed.

Eden Cooperative wild dog/fox management plans (Bombala and Far South Coast Community Wild Dog Control Plan and Wadbilliga Wild Dog Control Plan) have been developed between DECC, Forests NSW, the rural lands protection board and the community.

Southern Cooperative wild dog/fox management plans have been developed between DECC, Forests NSW, the rural lands protection board and the community in the DECC South West Slopes, Snowy Mountains, South Coast and Far South Coast regions. Effectiveness of actions under the plans are being assessed by the Far South Coast and South Coast regions and Forests NSW Southern region (Batemans Bay) using the FeralBASE database tool developed by DECC Far South Coast region. In the South West Slopes region the plans being implemented are a five-year plan in the Brindabella and Wee Jasper Valleys, a three-year plan in the Burrinjuck area, a two-year plan in the Adaminaby/Yaouk area, a two-year plan in the Goobragandra/Blowering locality of Kosciuszko National Park, a two-year plan in the East Gilmore Valley and a three-year plan in the Hume area.

Specific feral pig control programs were implemented with the assistance of neighbouring landholders on various reserves in DECC South West Slopes region. The South West Slopes region also participates in the Australian Alps Natural Heritage Working Group, Deer Workshop Coordinating Committee and the Wild Dog Working Group.

There is also a cooperative program covering shorebird protection and conservation initiatives on private land in the Southern region.

Section 5.4 – indicator 3.1, provides additional information of feral animal management programs.

Documentation

DECC

- a) DECC regional pest management strategies and pest management plans conducted with other agencies, local government, landowners and the community can be found on the DECC website at: <http://www.environment.nsw.gov.au/pestsweeds/index.htm>
- b) Further detail on pest animals can be found on the DECC website at: <http://www.environment.nsw.gov.au/pestsweeds/index.htm>
- c) DECC annual reports see: <http://www.environment.nsw.gov.au/whoweare/reports.htm>

Forests NSW

- d) Final ESFM plans can be found at: <http://www.dpi.nsw.gov.au/forests/management/esfm>
- e) Forests NSW, (2007a). Pest Animal Management Plan 2006, Central region, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- f) Forests NSW, (2007b). Pest Animal Management Plan 2006, North East region, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

Completed

Milestone 29

North East RFA Attachment 8 1(m)

Southern RFA Attachment 8 Point 2 (m)

New South Wales to incorporate within the Regional ESFM Plans and Plans of Management under the NPW Act 1974 integrated weed control programs

By the first five-year review

Progress of milestone

Forests NSW

Weed management is integrated into the Forests NSW regional ESFM plans published in 2005. Supplementary weed management plans have been produced for each region covering the period 2006–11 containing the details of the objectives, strategies, actions and cooperative arrangements with other government agencies, land managers and neighbouring land owners, for the control of priority weeds. Forests NSW regions produce annual weed management programs in close cooperation with stakeholders, to maximise program delivery across the landscape. Development of the programs, and their integration with the programs of other parties, takes place through meetings and correspondence.

DECC

Weed management programs are identified and prioritised in DECC regional pest management strategies and integrated into the NSW Threatened Species Priorities Action Statement, threat abatement plans, recovery plans and reserve management plans. Weed control programs are also integrated with other park management programs such as fire management. Refer to specific milestones regarding the preparation of management plans (see milestone 18) and recovery plans (see milestone 23).

DECC reserve management plans identify priority weed problems and the need for actions which are in turn addressed by statewide threat abatement plans or regional pest management strategies. Regional pest management strategies outline objectives and strategies for managing priority weeds across DECC reserves, aim to maximise the effectiveness of weed control programs, and outline how DECC will cooperatively manage weed issues across the landscape with other state government land-management agencies, local government, landowners and community groups.

DECC supports long-running cooperative programs with a variety of landholders, land-management agencies and interest groups for the management of weeds (e.g. bitou bush, lantana, scotch broom). For example in the Southern region there is also a cooperative program covering bitou bush management on private land.

Regional pest management strategies were in place for all DECC regions by June 2006. New strategies were drafted for the period 2008–11, put on public display from late 2007 to early 2008, and then published. The DECC website presents a range of information on agency weed programs.

Weed control programs in DECC's South West Slopes region were undertaken in targeted catchments, along roads, in high visitation/recreation areas and in areas where certain threatened species are vulnerable from weed invasion. Volunteer groups (e.g. Talbingo and District Bushwalking Group and the Oldfields Caretaker Group) are encouraged to assist in weed control. Snowy Hydro Limited and the South West Slopes region are working collaboratively to regenerate former Snowy Hydro Scheme sites for which weed control is a major component. The Roads and Traffic Authority and the South West Slopes region are also working in conjunction to reduce roadside weeds in Kosciuszko National Park. The South West Slopes region is also represented and participates in the Australian Alps Natural Heritage Working Group, Riverina Highlands Weeds Working Group, the Eastern Riverina Noxious Weeds Advisory Group, and the Southern Tablelands and South Coast Noxious Plants committees.

Section 5.4 – indicator 3.1 provides additional information of weed management programs.

Documentation

Forests NSW

- a) Final ESFM Plans can be found at: <http://www.dpi.nsw.gov.au/forests/management/esfm>
- b) Forests NSW, (2006). North East region, Weed Management Plan, Department of Primary Industries/Forests NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- c) Forests NSW, (2007c). Weed Management Plan 2006, Central region, Department of Primary Industries/Forests NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- d) Forests NSW, (2007d). Weed Management Plan 2006, Southern region, Department of Primary Industries/Forests NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

DECC

- e) DECC regional pest management strategies and pest management plans conducted with other agencies, local government, landowners and the community can be found on the DECC website at: <http://www.environment.nsw.gov.au/pestsweeds/index.htm>
- f) Further detail on weeds can be found at the DECC website at: <http://www.environment.nsw.gov.au/pestsweeds/index.htm>
- g) DECC annual reports see: <http://www.environment.nsw.gov.au/whoweare/reports.htm>

Review conclusion

Completed

4.13. Audit, review and reporting processes

Milestone 30

Eden RFA Attachment 7 Point 13

North East RFA Attachment 8 1(n)

New South Wales to establishing a process, including public reporting, for regular audits of compliance and reviews of Codes of Practice, Eco-Field Guides and/ Regional Prescriptions

By December 2002

Southern RFA Attachment 8 Point 2 (n)

New South Wales to establish a process, including public reporting, for regular audits of compliance and reviews of Codes of Practice, Eco-Field Guides and Regional Prescriptions

By 31 December 2002

Progress of milestone

Forests NSW

Auditing The initial step in developing the audit process involved the process being included in the draft Native Forest Management System (NFMS) overview which was displayed for public comment in September 2000. However, the NFMS has now evolved into an Environmental Management System (EMS) to cover all forest operations and includes planted forests and areas west of the divide that are not part of RFAs. One of the cornerstones of the Forests NSW EMS is its four-tiered audit system.

All forestry operations are audited consistent with Forests NSW four-tier system, which is defined in Circular 2003/01 Monitoring and Measuring Compliance of Operations. The four tiers comprise the following:

- Tier 1. (T1) Regular inspection, supervision, control and fortnightly reporting by field supervisors recording those facets of the operation where compliance with specifications is achieved and those facets where compliance is not achieved. In cases where compliance is not achieved, any remedial action required is to be recorded and followed up.
- Tier 2. (T2) Regular checks and documentation by Foresters and Forest Assistants, firstly to confirm the field supervisors are implementing T1, and secondly to assess the supervisors' application of specifications. Non-compliance is followed up and remedial action taken as required.
- Tier 3. (T3) Audits by appropriately qualified regional and divisional (including Head Office branches such as the Forest Practices Directorate) staff to confirm that T2 supervision, monitoring and non-compliance follow up is in place and that planning and operational systems are working consistently and effectively. This includes checks on the application of Forests NSW systems, specifications and standards.
- Tier 4. (T4) Random audits of operations by the Management Audit and Review Branch. These audits assess both the implementation of systems and application of specifications or prescriptions. Other matters assessed include standards of planning and compliance with regulatory approvals, codes of practice, Australian standards, and statutory requirements such as *Occupational Health and Safety Act 2000*, *Pesticides Act 1999* and *OHS Amendment (Dangerous Goods) Act 2003*.

The EMS monitors and assesses trends in non-conformances through the Non-Conformance Improvement Request system (NCIR). The incidents are recorded throughout all tiers. NCIRs are monitored at both a regional and corporate level to ensure each issue is resolved and is built into a continuous improvement cycle and that any emerging trends are addressed through appropriate means, such as inclusion in the relevant environmental management program (EMP).

In addition to internal audits, external EMS/AFS requirements are audited every nine months. Regulating authorities also carry out regular audits to check on compliance associated with the IFOA as discussed in the next section of this milestone.

Non-compliance issues that are identified in audit processes are rectified as appropriate and management systems improved to minimise future occurrences. Forests NSW is guided by auditors as to whether non-compliance is at acceptable levels.

Depending on the type of breaches, and the frequency, contractors are disciplined. Penalties are based on the severity of breaches ranging from warning letters, penalty infringement notices and suspension to termination. Contractors and operators are trained on all aspects of the operations to minimise compliance issues.

Results of audits by both internal and external regulators are contained in milestone 31. Australian Forestry Standard (AFS) audit outcomes are available on request.

Reporting Forests NSW continues to publicly report, at a statewide level, compliance and monitoring results in its *Social, Economic and Environmental (Seeing)* report. The compliance summary lists infringements notices issued by external regulators and lists the compliance checks made by Forests NSW as part of the internal monitoring and auditing strategy and associated compliance expressed as a percentage.

Public reporting of the results of monitoring and auditing compliance with the NSW FAs and the integrated forestry operations approvals is provided in the NSW FA reports each year (see milestone 8).

Review As part of the implementation of Forests NSW EMS, all operational control documents are regularly reviewed and updated in accordance with the time-frames specified within the documents, or within the document control procedures which describes the process for reviewing documents (including internal forest practices circulars) for consistency with current standards.

For example, in mid-2005, Forests NSW completed its review of the Forest Practices Code 1 (Plantations Code 1995) *Timber Harvesting in Forests NSW Plantations*.

DECC

Auditing The DECC Environment Protection and Regulation Group conducts audits of Forests NSW to determine whether it complies with requirements under the threatened species licence (TSL) and environment protection licence (EPL) in the IFOA, with section 120 of the *Protection of the Environment Operations Act 1997* (POEO Act), and with the Aboriginal cultural heritage provisions in NPW Act.

DECC endorsed a comprehensive audit and enforcement strategy to assess compliance with environmental legislation in July 2007. The principal aim is to provide an effective and efficient approach to auditing of forestry activities conducted by Forests NSW and enforcement of the TSLs, EPLs, POEO Act and NPW Act. The objectives of the strategy are:

- to ensure compliance by Forests NSW with the requirements of the TSL by investigating Forests NSW implementation of the licence conditions
- to ensure, for those areas that have EPL coverage, Forests NSW compliance with the requirements of the EPL by specifically investigating Forests NSW implementation of the licence conditions
- to ensure, for those areas that do not have EPL coverage, Forests NSW compliance with the pollution of waters provisions of section 120 of the POEO Act
- to maintain an up-to-date TSL and EPL based on current best management techniques and to use audit findings to review and improve the effectiveness of the licence
- to ensure the protection within state forests of Aboriginal objects and places, as defined under the NPW Act as those areas of special significance for Aboriginal culture

- to assess the magnitude and significance of community concerns reported to DECC and provide, where necessary, targeted investigations in response to those concern
- to communicate to Forests NSW the findings of audits, DECC recommendations, and action, if any, to be taken. The feedback mechanism, achieved through written correspondence and on-site meetings will promptly bring issues identified through the audit process to Forests NSW attention, and
- to apply the relevant DECC prosecution guidelines to forestry matters such that prosecution decisions are informed by the factors set down in the guidelines.

After conducting audits of Forests NSW, DECC assesses whether Forests NSW has complied with the conditions of the TSL, the EPL, the provisions of section 120 of the POEO Act, or the NPW Act (Aboriginal cultural heritage). DECC auditors and the relevant section of DECC, in consultation with DECC Legal Branch (where appropriate) then determine the most appropriate regulatory action to take against Forests NSW, having regard to the nature of any alleged breaches and the compliance history for a particular region. The appropriate regulatory action may include:

- *Formal letters.* Forests NSW is advised formally, in writing, where a DECC audit has been undertaken, and no breaches identified.
- *Warning letters.* This approach is used to provide written feedback to the Forests NSW regional manager to ensure that the requirements of the EPL, TSL, the provisions of section 120 of the POEO Act and NPW Act (Aboriginal cultural heritage) are articulated throughout Forests NSW in order to minimise systemic problems. Warning letters are sent at DECC director level to the Forests NSW regional manager. This letter is copied to Forests NSW Director Native Forests Operations Branch or Director Planted Forests Operations Branch.
- *Clean-up notices* (section 91 of the POEO Act) – reserved for those situations identified during a forestry audit where pollution has occurred or is likely to occur (EPL only).
- *Penalty notice* (NPW Act, POEO Act). The issuing of a penalty notice follows collection of detailed and accurate evidence through a forestry audit and is issued as soon as practicable after the offence is identified (not committed), following formal DECC Executive approval.
- *Prosecution through the local court or the Land and Environment Court* (POEO Act, NPW Act). DECC prosecutes according to relevant prosecution guidelines. DECC is also guided by the Premier's Memorandum 97–26 'Litigation involving Government Authorities'.

Details on results of compliance audits are shown in milestone 31. Section 5.8 – indicator 7.2 also provides additional detail about auditing activities.

Reporting Information on compliance with the TSL and EPL within the IFOAs are provided in the NSW FA annual reports (see milestone 8). The results of auditing are reported at milestone 31.

Additional information on compliance activities and the investigation of complaints is contained within the DECC annual report (see <http://www.environment.nsw.gov.au/howweare/reports.htm>).

Reviews Procedures and documents are reviewed on an ad hoc basis, depending upon the level of change that occurs over time.

Fisheries

Audits Focused threatened species compliance activities in relation to forestry operations are carried out by DPI (Fisheries) opportunistically where they coincide with DPI (Fisheries) compliance duties. DPI (Fisheries) investigates complaints as they are received.

Desk-top reviews of harvest-planning documentation are carried out routinely as documents are received. These reviews concentrate on the provision of specified aquatic habitat exclusion zones and appropriate road location where harvesting is to occur to minimise the necessity for watercourse crossings.

Details on results of compliance audits are shown in milestone 31.

Reporting Information on compliance with the *Fisheries Management Act 1994* licence within the IFOA is provided in the NSW FA reports, as described at milestone 8.

Reviews Procedures and documents are reviewed on an ad hoc basis.

IFOA amendments and review

Integrated forestry operations approvals (IFOAs) are granted jointly by the Minister for Climate Change and the Environment and the Minister for Primary Industries under the FNPE Act. IFOAs are intended to integrate the regulatory regimes for environmental planning and assessment, for the protection of the environment and for threatened species including fish. Accordingly they contain general conditions and licences for threatened species, environmental protection and threatened fish. An IFOA can be granted for up to 20 years and may be amended by both Ministers.

There have been three amendments to the IFOA for the LNE region, four for the UNE region, five for the Eden region and one for the Southern region.

The FNPE Act provides for a review of IFOAs, which began by a public exhibition of the proposed terms of reference for six months until December 2008. The review of the IFOA will involve:

- an assessment of the extent to which the terms of the three licences have been successfully integrated by, for example, identifying any unnecessary duplication and inconsistencies
- an in-house audit of compliance data to assess the extent to which conditions are being complied with, and to identify issues relating to non-compliance, and
- identification of any areas where improvements can be made in the administration of, enforcement of and compliance with the conditions.

Documentation

Forests NSW

- a) Forests NSW, (2003). Forest Practices Circular (FPC) 2003/01 Monitoring and Audit Compliance of Operations, Forests NSW Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- b) Forests NSW, (2006). Forest Practices Circular (FPC) 2006/17 Monitoring and Audit Manual, Forests NSW, Sydney.
- c) 1999–2000 Forests NSW Environmental and Social Values Report p. 22, may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- d) 2000–01 Forests NSW Social, Environmental and Economic Report p. 36, may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- e) 2001–02 Forests NSW Social, Environmental and Economic Report pp. 34, 36–37, may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- f) 2002–03 Forests NSW Social, Environmental and Economic Report p. 36, may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- g) 2003–04 Forests NSW Social, Environmental and Economic Report pp. 8 and 20, may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- h) 2004–2005 Forests NSW Social, Environmental and Economic Report p. 32, may be viewed on the DPI Forests website at
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>
- i) 2005–06 Forests NSW Social, Environmental and Economic Report pp. 10, 21 & 28, may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>

DECC

- j) DECC (2007) Audit and Enforcement Strategy Forestry Policy and Regulation Section, of DECC, Sydney, July 2007
- k) EPA Prosecution Guidelines see:
<http://www.environment.nsw.gov.au/legislation/prosguide/index.htm>

IFOAs and review

- l) FNPE can be found:
<http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Forestry%20and%20National%20Park%20Estate%20Act%201998%20No%20163%22&nohits=y>
- m) IFOAs can be found at:
<http://www.environment.nsw.gov.au/forestagreements/agreementsIFOAs.htm>
- n) A notice about the proposed terms of reference for the review of NSW FAs is at:
<http://www.environment.nsw.gov.au/resources/forestagreements/NoticeProposedTermsRef.pdf>
- o) Further information about the review (including the documents under review) is available online at: www.environment.nsw.gov.au/forestagreements/reviews.htm

Review conclusion

Completed

Milestone 31

Eden RFA Attachment 7 Point 13
North East Attachment 8 1(n)
Southern RFA Attachment 8 Point 2 (n)
New South Wales to undertake audits as described above
By the first and subsequent five-yearly reviews of the RFA

Progress of milestone

Tables 4.1 to 4.4 provide a summary of the audit information that is available for the Eden, North East (UNE and LNE), Eden and Southern regions from regulators such as DECC, DPI (Fisheries) and internal audits by Forests NSW.

The following additional information relates to fisheries audits in 2003–04 and 2004–05. In 2003–04, DPI (Fisheries) contracted Forests NSW to undertake an assessment and prioritisation of road crossings of watercourses that are a barrier to fish passage in the coastal catchments of NSW. This work was undertaken as part of a larger NSW Environmental-Trust-funded project being managed by DPI (Fisheries). The results have been used to identify priority sites for on-ground actions by the road-crossing owners, which include local government, the NSW Roads and Traffic Authority, Forests NSW and others. The results will also be provided to the five coastal catchment management authorities to assist with funding decisions for on-ground works to improve fish passage and river health.

DPI (Fisheries) and Forests NSW North East region completed an education field day to improve Forests NSW staff understanding of fish passage issues associated with road-crossing design and developed simple-to-use environmental assessment procedures to fulfil requirements for road-crossings assessment and approval in the Fisheries licence under the part 7 of the FM Act within the IFOAs. The procedures are being tested in the UNE.

Table 4.1: Audit results in the Upper North East region

	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Environment Protection Licence							
Comprehensive audits	4	5	7	4	4	3	1
Non-compliance incidents	-	12	79	20	58	61	7
Complaints	-	None	None	Yes	None	2	1
Feedback	-	Yes	Yes	Yes	Yes	Yes	Yes
Penalty notices	2	None	None	2	No	1	No
Warning letters	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clean-up notice	-	None	1	-	-	-	-
Remedial work (number of locations)	-	Yes (8)	Yes (6)	Yes (4)	Yes (29)	Yes (5)	Yes (5)
Request to obtain expert advice (number)	-	Yes (7)	No	No	Yes (4)	Yes (2)	Yes (4)
Enforcement	-	None	None	None	None	None	None
Threatened Species Licence							
Proactive audits	-	-	-	-	2 (one administrative)	3	1
Complaints	-	-	-	-	8	None	1
Breaches/contraventions	-	-	-	-	Numerous	2	5
Enforcement action	-	-	-	-	Warning letters issued.	Warning letters issued	Warning letter issued
Fisheries Licence							
Audits/complaints	None	None	None	None	None	None	None
Contraventions (number)	None	None	None	None	None	None	None
Advice provided/enforcement	None	None	None	None	Yes	Yes	None
Forests NSW							
Non-compliance incidents – soil erosion and water	211	106	193	172	119	48	39
Non-compliance incidents – flora and fauna	144	59	110	73	84	98	86
Non-compliance incidents – fish habitat and passage	0	0	0	0	0	0	0
Non-compliance incidents – other issues such as safety	16	21	55	25	50	13	1
Non-compliance incidents – total	371	186	358	270	253	159	126

Table 4.2: Audit results in Lower North East region

	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Environment Protection Licence							
Comprehensive audits	-	2	8	7	4	3	4
Non-compliance incidents	-	16	55	140	77	66	155
Complaints	-	None	1 ⁸	None	None	2	4
Feedback	-	No	Yes	Yes	Yes	Yes	Yes
Penalty notices	-	No	No	No	No	Yes (2)	Yes (3)
Warning letters	-	Yes (1)	Yes	Yes	Yes	Yes	Yes (3)
Remedial work (number of locations)	-	Yes (5)	Yes (9)	Yes (8)	Yes (19)	Yes (7)	Yes (29)
Request to obtain expert advice	-	No	No	Yes (4)	Yes (1)	Yes (2)	Yes (7)
Clean-up notices	-	No	No	No	No	Yes (2)	Yes (1)
Enforcement	-	No	No	(Being considered)	Prosecution action commenced	Yes ⁹	No
Threatened Species Licence							
Proactive audits	-	-	-	-	2 (one administrative)	3	2
Complaints	-	-	-	-	1	2	4
Breaches/non-compliances	-	-	-	-	Many	27	19
Enforcement action	-	-	-	-	Warning letters issued	Warning letters issued	Warning letters issued
Fisheries Licence							
Audits/complaints	None	None	Yes	None	None	None	None
Non-compliances/contraventions	None	None	1 ¹⁰	None	None	None	None
Advice provided/enforcement	None	None	Yes	Yes	Yes	None	None
Forests NSW							
Non-compliance incidents – soil erosion and water	239	204	147	148	124	33	24
Non-compliance incidents – flora and fauna	176	139	98	105	65	54	33
Non-compliance incidents – fish habitat and passage	0	0	0	6	0	0	0
Non-compliance incidents – other issues eg safety	26	64	79	38	53	103	63
Non-compliance incidents – total	441	407	324	291	248	190	120

⁸ 49 breaches were included in the complaint

⁹ Prosecution finalised for a road collapse in Chichester State Forest in May 2003

¹⁰ Compliance issues related to reporting anomalies

Table 4.3: Audit results in Southern region

	2001–02	2002–03	2003–04	2004–05	2005–06
Environment Protection Licence					
Comprehensive audits	1	6	4	2	2
Non-compliance incidents	3	196	35	1	87
Complaints	None	1 (77 breaches)	None	3	4
Penalty notices	None	None	None	None	None
Warning letters	Yes	Yes	Yes	None	Yes
Remedial work (number of locations)	Yes (2)	Yes (4)	Yes (7)	Yes (1)	Yes (14)
Request to obtain expert advice (number)	None	Yes (1)	Yes (2)	None	Yes (1)
Enforcement action	None	Being considered for three audit locations	None	None	None
Threatened Species Licence					
Proactive audits	Not undertaken	None	4	2	2
Complaints	-	South Coast (2) Tumut (none)	3	3	4
Breaches/contraventions	-	None	None	None	20
Enforcement action	-	None	None	None	Warning letter issued
Fisheries Licence					
Audits/complaints	Not undertaken	None	None	None	None
Contraventions (number)	-	None	None	None	None
Advice provided/enforcement	-	None	Yes	Yes	None
Forests NSW					
Non-compliance incidents – soil erosion and water	-	508	422	290	90
Non-compliance incidents – flora and fauna	-	134	182	122	4
Non-compliance incidents – fish habitat and passage	-	0	0	0	0
Non-compliance incidents – other issues such as safety	-	273	246	292	251
Non-compliance incidents – total	-	915	850	704	345

Table 4.4: Audit results in the Eden region

	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Environment Protection Licence							
Comprehensive audits	2	3	5	2	2	4	1
Non-compliance incidents	-	34	36	24	32	17	83
Complaints	-	None	1	None	None	3	1
Penalty notices	No	No	No	No	No	No	No
Warning letters	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remedial work (number of locations)	-	Yes (17)	Yes (5)	Yes (2)	Yes (13)	Yes (5)	Yes (8)
Clean-up notices	-	No	No	No	No	No	Yes (1)
Request to obtain expert advice (number)	-	No	Y(1)	No	Yes (1)	Yes (1)	Yes (1)
Enforcement action	-	-	None	None	None	None	None
Threatened Species Licence							
Proactive audits	-	-	1	1	1	4	1
Complaints	-	-	No	No	2	3	1
Breaches/contraventions	-	-	3	None	1	None	8
Enforcement action	-	-	None	None	None	None	Warning letter issued
Fisheries Licence							
Audits/complaints	None	None	Yes	None	None	None	None
Contraventions (number)	None	None	None	None	None	None	None
Advice provided/enforcement	None	None	Yes	None	Yes	Yes	None
Forests NSW							
Non-compliance incidents – soil erosion and water	366	223	259	193	144	115	116
Non-compliance incidents – flora and fauna	76	172	189	53	111	117	155
Non-compliance incidents – fish habitat and passage	0	0	0	0	0	0	0
Non-compliance incidents – other issues such as safety	37	22	0	2	0	8	1
Non-compliance incidents – total	479	417	448	248	255	240	272

Documentation

- a) Forests NSW 2003 Forest Practices Circular (FPC) 2003/01 Monitoring and Audit Compliance of Operations, Forests NSW, Sydney
- b) Forests NSW 2006 Forest Practices Circular (FPC) 2006/17 Monitoring and Audit Manual, Forests NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

Completed

4.14. Forest management systems on public and private lands

Milestone 32

Eden RFA Attachment 5 Point 2(b)

New South Wales to publish the document Ecologically Sustainable Forest Management for the Eden RFA Assessment

Within six months of signing

Progress of milestone

The report titled 'Ecologically Sustainable Forest Management for the Eden RFA Assessment' (1998) is complete and publicly available.

Documentation

See NSW Ecologically Sustainable Forest Management Group (1998) Ecologically Sustainable Forest Management for the Eden RFA Assessment, A project undertaken for the Joint Australian Government /NSW RFA Steering Committee as part of the NSW Comprehensive Regional Assessments at: <http://www.daff.gov.au/rfa/regions/nsw-eden/esfm-report>

Review conclusion

Completed

Milestone 33

Eden RFA clause 56

North East RFA clause 57

Southern RFA clause 56

New South Wales to produce a code of practice for timber harvesting of native forest on private lands

By the first five-yearly review

Progress of milestone

On 1 August 2007 the Native Vegetation Regulation 2005 was amended to regulate private native forestry including a code of practice. The code has four parts covering the different forests of the state:

- Northern NSW north of Sydney CBD
- Southern NSW south of the Sydney CBD
- River red gum forests, and
- Cypress and western hardwood forests.

The Government also introduced a \$39-million package to assist industry and forest workers, to develop a training and education program, and to expedite the implementation of the Code of Practice.

This is an interim arrangement until separate PNF-specific legislation is developed and implemented. Planning for this legislation has commenced, and at this stage it is planned to carry over the existing PNF Code to the new legislation.

Documentation

Native Vegetation Amendment (Miscellaneous) Regulation 2008 see:
http://www.advertising.nswp.commerce.nsw.gov.au/NR/rdonlyres/e7vejczb22scjc3mrvitb5g63ipyh w4qgb4daikwmqxm5ruwtaeemca3yegrztczscxqgw4qlypwc/8th_February.pdf

Review conclusion

Completed

Milestone 34

North East RFA Clause 58

NSW to complete code of practice for plantations on private land

31 December 2000

Southern RFA clause 57

NSW to complete code of practice for plantations on private land

By 30 June 2001

Progress of milestone

This milestone was achieved through the implementation of the Plantations and Reafforestation (Code) Regulation 2001 in December 2001.

The *Plantations and Reafforestation Act 1999* (P&R Act) and code provide a certainty for harvesting previously provided under the *Timber Plantations (Harvest Guarantee) Act 1995* (TPHG Act). Plantations certified under the TPHG Act are deemed to be authorised under the PR Act.

A statutory review of the P&R Act and code commenced in January 2005. A discussion paper was released in June 2005, and a report on the outcomes of the review was submitted to Parliament in December 2005.

Five inter-agency working groups were convened in 2006 to develop necessary amendments to the PR Act and code to progress the recommendations in the report. An industry reference group also met to consider proposals put forward by the working groups.

Documentation

- a) P&R Act see:
<http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Plantations%20and%20Reafforestation%20Act%201999%20No%2097%22&nohits=y>
- b) Plantations and Reafforestation (Code) Regulation 2001 see:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?SRTITLE=%22Plantations%20and%20Reafforestation%20\(Code\)%20Regulation%202001%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?SRTITLE=%22Plantations%20and%20Reafforestation%20(Code)%20Regulation%202001%22&nohits=y)

Review conclusion

Completed

Milestone 35

Eden RFA Attachment 5 Point 2(f)
North East RFA Attachment 6 2(d)
Southern RFA Attachment 6 Point 2 (d)
New South Wales to document and publish a description of the NSW Forest Management System covering public and private lands. In time for the first five-yearly review

Progress of milestone

A draft report has been prepared that builds on and updates the overviews on the agencies contained in the ESFM report entitled *Description of Management Systems and Processes for Achieving Ecologically Sustainable Forest Management in NSW*. The revised report will be published in the near future.

Documentation

The report *Description of Management Systems and Processes for Achieving Ecologically Sustainable Forest Management in NSW* is available at <http://www.daff.gov.au/rfa/publications/cra-state>

Review conclusion

Underway

4.15. Management by Forests NSW

Milestone 36

Eden RFA clause 46(c) New South Wales to complete and publish a Regional ESFM Plan for state forests
By 1 April 2000
North East RFA clause 48(d) New South Wales to complete and publish Regional ESFM Plans for state forests.
By 30 June 2000
Southern RFA clause 47 (d) New South Wales to complete and publish Regional ESFM Plans for state forests
By 31 December 2001

Progress of milestone

The Forests NSW *Ecologically Sustainable Forest Management Plans* incorporate the blueprint for achieving the principles of ecologically sustainable forest management for state forests. It sets out the broad strategies, performance indicators and measurement outcomes for management of state forests in the region over a five-year period.

Draft regional version of the plans were displayed for public comment in September 2000 for the Eden and North East region (i.e. LNE and UNE).

Feedback received during the public exhibition and discussion with regulatory agencies resulted in further refinement of the plans. The plans were completed in early 2005 and followed by a further public exhibition period. The plans were finalised in August 2005.

Forests NSW placed two regional plans covering the South Coast and Tumut subregions of the Southern region on public display in early 2005. Further public and state agency comment was considered prior to finalisation. The plans were finalised in August 2005.

Supplementary plans that specifically address areas of significant environmental risk to the forests are being developed. For example plans have been developed to manage pests and weeds, while draft plans have been prepared for grazing and management of dedicated and informal reserves. These draft plans are used for consultation purposes.

Documentation

Final ESFM plans can be found at: <http://www.dpi.nsw.gov.au/forests/management/esfm>

Review conclusion

Completed

Milestone 37

Eden RFA clause 46(d)

New South Wales to implement the Forest Management Zoning system for the Eden region

By 1 October 1999

North East RFA clause 48(e)

New South Wales to implement the Forest Management Zoning system for the Upper North East and Lower North East regions

By 30 June 2000

Southern RFA clause 47 (e)

New South Wales to implement the Forest Management Zoning system for the Southern region

By 31 December 2001

Southern RFA clause Attachment 1 Point 5

NSW will finalise the Forest Management Zoning System

By 31 December 2001

Progress of milestone

Public announcement of Forest Management Zones (FMZ) and release of *Managing our Forests Sustainably: Forest Management Zoning in NSW State Forests* occurred in March 1999.

A geographic information system (GIS) operational layer was agreed at the time of the signing of the NSW FAs for the UNE and LNE regions in 1999. These areas were illustrated on maps attached to Forests NSW draft regional ESFM plans, publicly exhibited in 2000. A FMZ layer was publicly displayed with the regional ESFM plans in early 2005 and has been attached to the final documents (see milestone 36).

The maps illustrate the areas of state forest to be principally managed for conservation purposes and those to be principally managed for timber production by applying the FMZ system. The FMZs have been progressively implemented across state forests in the region. Minor changes have been made to some FMZs, such as areas classified as FMZ 8 (lands for further assessment).

See section 5.3 – indicator 2.1.a for more details.

Documentation

- a) Maps indicating FMZ allocation can be found at the back of each ESFM Plan 2005, which may be found on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/esfm>
- b) State Forests of NSW, (2000c). *Managing our Forests Sustainably: Forest management Zoning in NSW State Forests*. State Forests of NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

Completed

Milestone 38

North East RFA Attachment 8 1(o) NSW will establish demonstration areas in both the Upper North East Region and the Lower North East Region for illustrating silvicultural practices and the suite of silvicultural regimes practiced

By April 2001

Progress of milestone

Forests NSW have established three sites as silvicultural demonstration areas in the UNE region including Divines and Wedding Bells state forests and two in the LNE region including Queens Lake (2001) and Kiwarra (2002).

These sites are used to assist the training of forest operators, covering a range of forest types and silvicultural regimes permissible under the IFOA.

Documentation

Forests NSW *Bush Telegraph*, May–July 2001, pp. 8 (The May–July 2001 edition of *Bush Telegraph* is not available on the DPI Forests website. To obtain, contact the editor, Leah Flint, on 02 4931 6541 or email: leah.flint@dpi.nsw.gov.au.)

Review conclusion

Completed

Milestone 39

North East RFA Attachment 6 2(b)

NSW will publish of eco field guides for the Upper North East Region and the Lower North East Region

By 30 June 2000

Southern RFA clause Attachment 6 Point 2(b)

NSW will publish eco field guides for Southern region

By 31 December 2001

Progress of milestone

North East region

This milestone has been completed for the North East RFA region. Eco field guides for the UNE and LNE regions were published in 2003.

Southern region

The guide for the South Coast subregion *Field Guide to Flora, Fauna and Heritage Features of Forest Management on the South Coast of NSW* was published in late 2005.

The guide for Tumut subregion has been considered but a separate document is unlikely to be needed. The South Coast field guide is used where appropriate.

Documentation

- a) Forests NSW (2000) *Field Guide to Forest Management in North East NSW*. Forests NSW, Sydney
- b) Forests NSW (2005b) *Field Guide to Flora, Fauna and Heritage Features of Forests Management on the South Coast of NSW*. Forests NSW, Sydney

Review conclusion

North East – completed

South Coast – completed

Tumut – concluded

Milestone 40

Eden Attachment 5 Point 2(c)

New South Wales to document the basis for silvicultural practices and publish silvicultural guidelines for commercial forest types

By 31 March 2000

North East RFA Attachment 6 2(c)

North East RFA Attachment 8 1(s)

New South Wales to publish a native forest silviculture manual (SFNSW)

By 31 December 2000

Southern RFA clause Attachment 6 Point 2 (c)

New South Wales to document the basis for silvicultural practices and publish a native forest silviculture manual (SFNSW)

By 31 March 2001

Progress of milestone

Forests NSW published a *Native Forest Silviculture Manual* in September 2000. The manual complements its field guides and training programs, documents the basis for Forests NSW silvicultural practices, and contains silvicultural specifications and guidelines. The manual was reviewed by the Australian National University and the Institute of Foresters of Australia.

To complement this manual, two documents were produced in 2002 that provide guidance on the silviculture permitted by the integrated forestry operation approvals for the UNE, LNE and Southern regions – 'Implementation of IFOA Silviculture in the Southern FA region' and 'Implementing Silviculture in LNE and UNE'.

Additionally a *Rainforest Protocol* (Forests NSW Forest Practices Circular No. 2005/02) provides procedures to be used in mapping and field identification of forest types with rainforest elements. It provides guidance on where exclusion boundaries should be identified to protect them from specified forestry activities. It applies to the Eden and North Coast regions and the South Coast part of Southern region.

Documentation

- a) State Forests of NSW (2000a). *Native Forest Silviculture Manual*, State Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- b) State Forests of NSW (2002). Forest Practices Circular 2002/3 Implementation of IFOA Silviculture in the Southern FA region, State Forests of NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- c) State Forests of NSW (2002). Forest Practices Circular 2002/3 Implementing Silviculture in LNE and UNE, State Forests of NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- d) State Forests of NSW (2005). Forest Practices Circular 2005/02 'Rainforest Protocol', State Forests of NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- e) IFOAs can be found at:
<http://www.environment.nsw.gov.au/forestagreements/agreementsIFOAs.htm>

Review conclusion

Completed

Milestone 41

Southern RFA Attachment 6 Point 2 (f)

NSW will produce annual reports of progress for meeting targets in regional ESFM plans

Annually

Progress of milestone

As noted in milestone 36, ESFM Plans were published in 2005. A process for reporting on these plans is being considered. A draft report template has been prepared consistent with the new Montreal Indicators. Forests NSW regions are currently being consulted on this.

Reporting on Forests NSW milestones in NSW FAs, compliance with IFOAs and results of monitoring the ESFM indicators are contained in the implementation reports discussed in milestone 8.

Documentation

- Not applicable

Review conclusion

Underway

4.16. Inventory of private forests

Milestone 42

North East RFA Attachment 12 Part D 21 Dot 5

Use best endeavours to undertake an inventory of private forests to determine the basis of yield of wood products

Within five years of signature

Progress of milestone

The following inventories have been completed or are under way in the North East region:

- 1) Southern New England private native forest (PNF) inventory:
 - Covered the PNF resource within a 100kilomteres radius of Walcha
 - Used aerial photography (AP) and geographic information system (GIS) interpretation with some field verification
 - Carried out in 2001
 - Estimated sawlog and other wood volumes, both standing and available on an annual sustainable basis, with and without silvicultural management.

- 2) Mid North Coast forest species type mapping:
 - Forest species-type mapping, based on 1999 RFA data
 - Southern Cross University PhD research and Mid-North Coast Regional Development Board
 - UNE mapping carried out in 2002–04
 - LNE mapping carried out in 2006
 - Yield determinations have not been published, but are available on commercial terms
 - Landowners in the UNE allowed access to forests, but no site visits were undertaken for the LNE or the North-east Tablelands.

- 3) The *Private Native Forestry and Plantation Resource of the NSW North Coast Report*:
 - Detailed inventory currently being prepared with Department of Agriculture, Fisheries and Forestry, and funding from Northern Rivers Private Forestry Development Committee
 - Project managed by the Bureau of Rural Sciences
 - Data consists of 625 plots
 - Information to be gathered on basal areas, species, diameter at breast height, biodiversity and products
 - Report due for completion in 2009 – contact Northern Rivers Private Forestry Development Committee details at <http://www.privateforestry.org.au/feedback.htm>

In relation to plantations, the Department of Primary Industries does not collect yield data as part of the authorisation or the subsequent regulatory requirements under the P&R Act. Information may be available from individual plantation companies, such as Forest Enterprises Australia.

Documentation

- a) Southern New England PNF Inventory – report available from:
<http://www.nio.com.au/index.php?page=Southern-New-England-Private-Forest-Inventory--2001>
- b) Information and contacts on private forestry can be found at:
<http://www.privateforestry.org.au/>
- c) *Private Native Forestry and Plantation Resource of the NSW North Coast Report* at
http://www.privateforestry.org.au/private_nat_for_res_ntnsw1.htm

Review conclusion

Concluded

4.17. Competition principles agreement

Milestone 43

Eden RFA clause 86

New South Wales to review legislation and policies relevant to the allocation and pricing of hardwood logs from State forests as part of the Competition Principles Agreement

Before the end of 1999

Progress of milestone

NSW provided a *Report to the National Competition Council on the Application of the National Competition Policy in NSW* to the National Competition Council for the year ending December 2000 on the implementation of the National Competition Principles.

There has been no review of legislation. However, the *Competition Policy Reform (New South Wales) Act 1995* gives effect to part IV of the *Trade Practices Act 1974* which aims to ensure that allocation and pricing of goods and services provided by state agencies is fair and consistent with trading in a free and open market.

Like other parties to the Competition Principles Agreement, the NSW Government agreed, where appropriate, to adopt the Financial Policy Framework (FPF), which provides a model to mimic a private sector competitive market. The FPF requires:

- commercially based targets of rates of return
- dividends and capital structures
- regular performance monitoring
- the payment of state and Australian Government tax equivalents, and
- payment of risk-related borrowing fees.

Forests NSW has been operating under the conditions of the FPF since becoming a Government Trading Enterprise in 1997, and is complying with National Competition Policy principles.

For consistency with the FPF, Forests NSW developed a log pricing system by which log prices are set consistent with market factors. The pricing system was amended to update assumptions within the residual value-pricing model and remove a number of anomalies. These amendments included the removal of the remaining 10% capping of price variations in relevant pricing zones. The log value pricing system was also expanded to include the linkage of small sawlog prices to quota sawlog prices. The main objective of the final stage of the improvements to the pricing system was to create a greater consistency of hardwood sawlog prices with market value.

The system has been included in the wood supply agreements to ensure it cannot be changed without consultation. Within the agreements there is a mechanism to adjust the price based on market factors. Adjustments have been made twice-yearly as appropriate.

The National Reform Agenda succeeds the National Competition Policy and was initiated at the February 2006 Council of Australian Governments (COAG) meeting.

Documentation

- a) *Report to the National Competition Council on the Application of the National Competition Policy in NSW* at:
http://www.dpc.nsw.gov.au/publications/memos_and_circulars/ministerial_memoranda/2001/m2001-15
- b) *Competition Policy Reform (New South Wales) Act 1995* at:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Competition%20Policy%20Reform%20\(New%20South%20Wales\)%20Act%201995%20No%208%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22Competition%20Policy%20Reform%20(New%20South%20Wales)%20Act%201995%20No%208%22&nohits=y)
- c) State Forests of NSW (2000b). The Price System, State Forests of NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- d) COAG National Reform Agenda is at: <http://www.coag.gov.au>

Review conclusion

Concluded

4.18. Timber supply supplementation

Milestone 44

North East RFA Attachment 12 Part C 19

Subject to availability of suitable land, NSW will purchase private lands and/ or timber rights to supply high-quality large sawlogs and large veneer logs

By the end 2004

Progress of milestone

At 30 June 2005, 11 properties had been purchased across the North East region (three in the UNE and eight in the LNE) under the Private Property Timber Supplementation Program (see table 4.5). These cover an area of more than 13,000 hectares of native forest with an estimated standing volume of 141,439 cubic metres of high-quality large quota sawlogs.

As at June 2005, three timber sale agreements for purchase of private property timber rights have been implemented across the LNE region with a further 10,962 cubic metres of high-quality large sawlogs estimated to be produced.

In sourcing 152,401 cubic metres of supplementary high-quality large sawlog resource to the end of June 2005, Forests NSW has made substantial progress in achieving the targeted outcome of 180,000 cubic metres. While additional properties may be considered, it is more likely that timber rights will be purchased as suitable areas become available.

Table 4.5: Summary of private property timber supplementation

Lower North East region	
Area (hectares)	HQL (cubic metres)
5,681	25,450
689	2243
29	1200
134	1638
2208	26,412
1722	48,013
26	646
Upper North East region	
Area (hectares)	HQL (cubic metres)
486	11,181
257	2162
1447	12,392
704	10,102

Documentation

- a) Progress on Private Property Timber Supplementation Program reported in RFA annual reports see:
http://www.daff.gov.au/__data/assets/pdf_file/0010/608284/0203-ne.pdf
http://www.daff.gov.au/__data/assets/pdf_file/0008/50489/ne_anrep_2002.pdf
http://www.daff.gov.au/__data/assets/pdf_file/0006/50487/ne_final_anrep_2001.pdf
- b) State Forests of NSW (2003). *Annual Report 2002–03*, State Forests of NSW, Sydney – available at <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>

Review conclusion

Underway

Milestone 45

North East RFA Attachment 12 Part C 19

Subject to availability of suitable land NSW will establish at least 10,000 hectares of hardwood plantations

By the end 2004

Progress of milestone

Forests NSW successfully established 7543 hectares of hardwood plantation in the region between 1999 and 2004.

Strong real estate prices and competition for land made it difficult for Forests NSW to secure additional hardwood plantations.

Note that an incorrect figure of 10,607 hectares was provided in the RFA annual reports. This is because Forests NSW has removed the inclusion of the figure (i.e. 1465 hectares) for the Tokyo Electric Power Company plantation. The plantation was established as a result of a commercial deal and these plantations may not contribute to any future timber supplies in the North East region. Also a revision of the plantation area determined that the initial area reported was gross

area. As a result of forest health issues, including pest, disease and plantation losses due to drought, the established area has been further reduced.

Documentation

State Forests of NSW (2002). *Annual Report 2001–02*, State Forests of NSW, Sydney – available at <http://www.dpi.nsw.gov.au/aboutus/resources/corporate-publications>

Review conclusion

Underway

4.19. FRAMES tool, not including sustainable yield and volume review

Milestone 46

Eden RFA Attachment 5 Point 2(g)

New South Wales to publish a description of the FRAMES system referred to in clause 46 (f)

Within three months

Progress of milestone

A technical report, 'Eden Forest Resource and Management System Report', was published in May 1998. It describes the objectives, methods and outcomes of FRAMES projects that were undertaken as part of the Eden CRA.

Documentation

State Forests of NSW and Bureau of Resource Sciences (1998). Eden Forest Resource and Management System Report, A report for the NSW CRA/RFA Steering Committee, Sydney, see: http://www.daff.gov.au/__data/assets/pdf_file/0018/50463/nsw_ed_frm.pdf

Review conclusion

Completed

Milestone 47

Southern RFA Attachment 8 Point 5

SFNSW will publish all FRAMES CRA reports for the Southern region

By 30 September 2001

Progress of milestone

All four FRAMES CRA reports for the Southern region were published including:

- Strategic Inventory Report – Southern Region (NA 04/FRA)
- Biometric Models Southern CRA Region (South Coast and Tumut Subregions) (NA 13/FRA)
- Yield Simulator Southern Region (NA 14/FRA)
- Strategic Yield Scheduler Southern Region (NA 54/FRA)

Documentation

- a) State Forests of NSW (2000). Strategic Inventory Report – Southern Region, A report for the NSW CRA/RFA Steering Committee, Sydney (NA 04/FRA) available at: <http://www.daff.gov.au/rfa/publications/cra-state>
- b) State Forests of NSW (2000). Biometric Models Southern CRA Region (South Coast and Tumut Subregions), A report for the NSW CRA/RFA Steering Committee, Sydney (NA 13/FRA) available at: <http://www.daff.gov.au/rfa/publications/cra-state>
- c) State Forests of NSW (2001). Yield Simulator Southern Region, A report for the NSW CRA/RFA Steering Committee, Sydney (NA 14/FRA) available at: <http://www.daff.gov.au/rfa/publications/cra-state>
- d) State Forests of NSW (2001). Strategic Yield Scheduler Southern Region, A report for the NSW CRA/RFA Steering Committee, Sydney (NA 54/FRA) available at: <http://www.daff.gov.au/rfa/publications/cra-state>

Review conclusion

Completed

Milestone 48

Eden RFA Attachment 11 Point 5 New South Wales to establish a continuous FRAMES development program for the Eden region consistent with the Statewide FRAMES - By the first five-yearly review

North East RFA clause 81 NSW to review FRAMES

By 1 December 2006

North East RFA Attachment 12 Part B 15 SFNSW will complete the enhancement of FRAMES

By 1 December 2006

Southern RFA Attachment 8 Point 7. NSW will establish and implement an ongoing FRAMES development program

By 1 December 2006

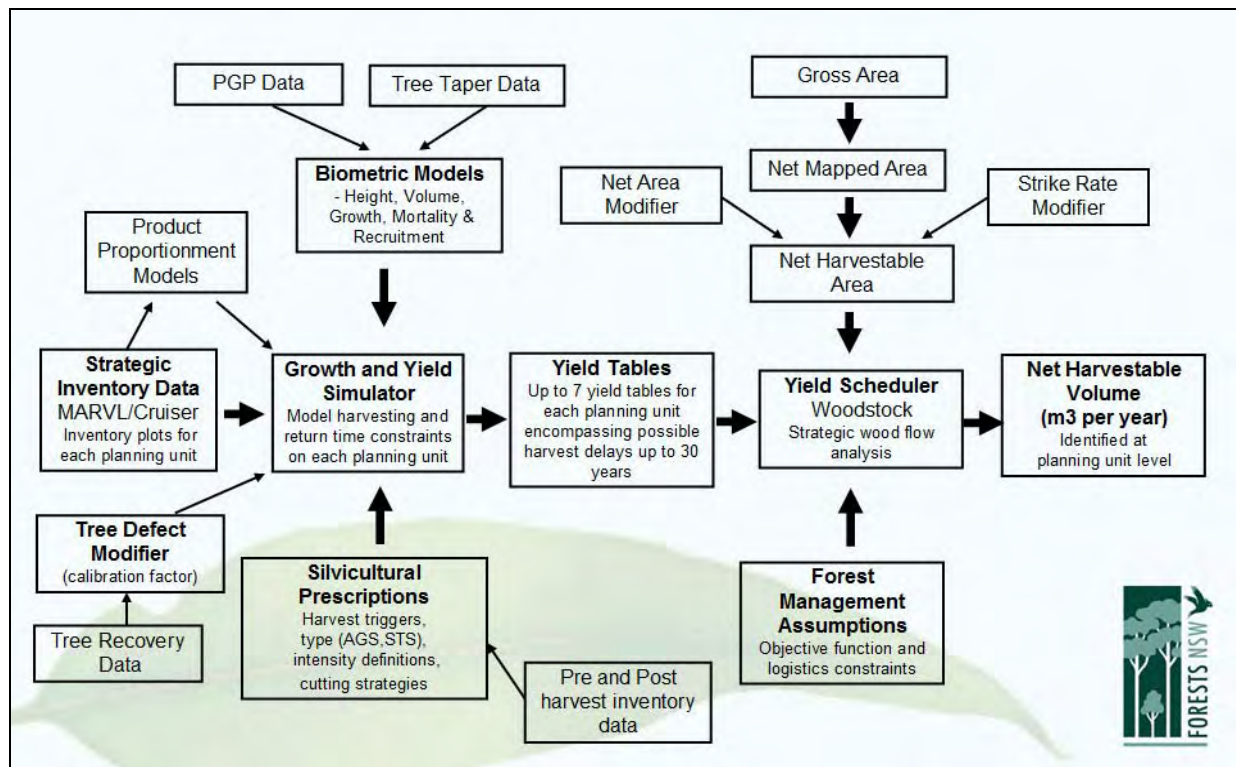
Progress of milestone

Description of FRAMES

FRAMES (Forest Resource Assessment and Management Evaluation System) is a statewide (except Eden region) toolkit of applications developed by Forests NSW to calculate long-term wood supply volumes from areas of native forest where timber harvesting is permitted. FRAMES is designed to be as transparent as practicable in its operation.

An overview of these tools and how they link together is shown in Figure 4.1. Components are discussed below.

Figure 4.1: Components of FRAMES and information flows



The impetus for development of FRAMES was provided by the need to support the RFA process between the NSW and the Australian governments. The RFA process seeks to establish a comprehensive, adequate and representative reserve system and an ecologically sustainable and

internationally competitive timber industry within an RFA region. Achievement of this aim required a toolkit that could calculate long-term supply volumes of timber products under a range of different scenarios and 'rules' that applied to that timber harvesting.

FRAMES was developed under a Resource and Conservation Assessment Council technical committee of representatives of NSW and Australian government agencies, industry, conservation groups and unions. It employed an external expert to guide its development, and an independent external expert to review it prior to RFA negotiations.

FRAMES comprises modules that address:

- inventory (a detailed sample of what trees are currently present in the forest) – see next milestone
- growth modelling (how the forest will look in the future)
- yield simulation (integration of inventory, growth and harvest simulation)
- area calculation (the area of the forest actually harvested), and
- long-term timber supply calculation (what can be harvested each year to meet long-term supply intentions).

Growth models

Models were developed to predict the growth of trees using the Forests NSW database of permanent growth plots. This data was used in conjunction with a range of environmental variables, such as rainfall, soil type and soil moisture index. Altogether some 40,000 individual tree measurements were used in the model development process.

The growth models predict diameter increment for individual trees. The species, size and surrounding competition of a tree all influence its growth performance in the model. Separate models were also developed for calculating the taper of trees, the volume of individual trees, the recruitment of trees into the youngest size class, and tree mortality.

Yield simulator

The yield simulator brings together the starting stand descriptions, the growth models and a range of harvesting modifiers to predict log availability by log-quality class over time. This prediction takes account of a range of factors that impact on the actual harvestable volume at any time:

- the starting description of the stand
- growth rates of the stand given that starting description
- changes in stand structure over time
- the silvicultural prescription applied to that stand – exactly what trees are intended to be harvested under the silviculture to be applied (e.g. single tree selection or group selection) and what should be retained post-harvest
- conservation protocols that apply to harvesting within a stand and which impact on the number of trees that can be harvested within a harvesting area (e.g. trees can be retained for habitat or filter strip requirements), and
- the correlation between assessed volume (by inventory plots) and actual volume that is harvested within a normal operation, to account for issues such as unseen defects within the trees.

The yield simulator enables plots with similar features, or harvest intents, to be grouped together for analysis. These groups are referred to as stratum. Potential harvest-volume predictions are calculated for each strata on a yield-per-hectare basis.

Area calculation

The previous modules work on a per-hectare basis to predict yields of various log-product classes available over time. These per-hectare estimates need to be applied to the hectares actually harvestable to predict total harvestable volumes over time. Area calculation excludes all areas in

which harvesting does not occur, either for physical reasons or to meet specific conservation protocols. Area calculation also takes into account harvest area exclusions that cannot be mapped, and which reduce the forest available for harvesting.

Forest estate modelling (yield scheduling)

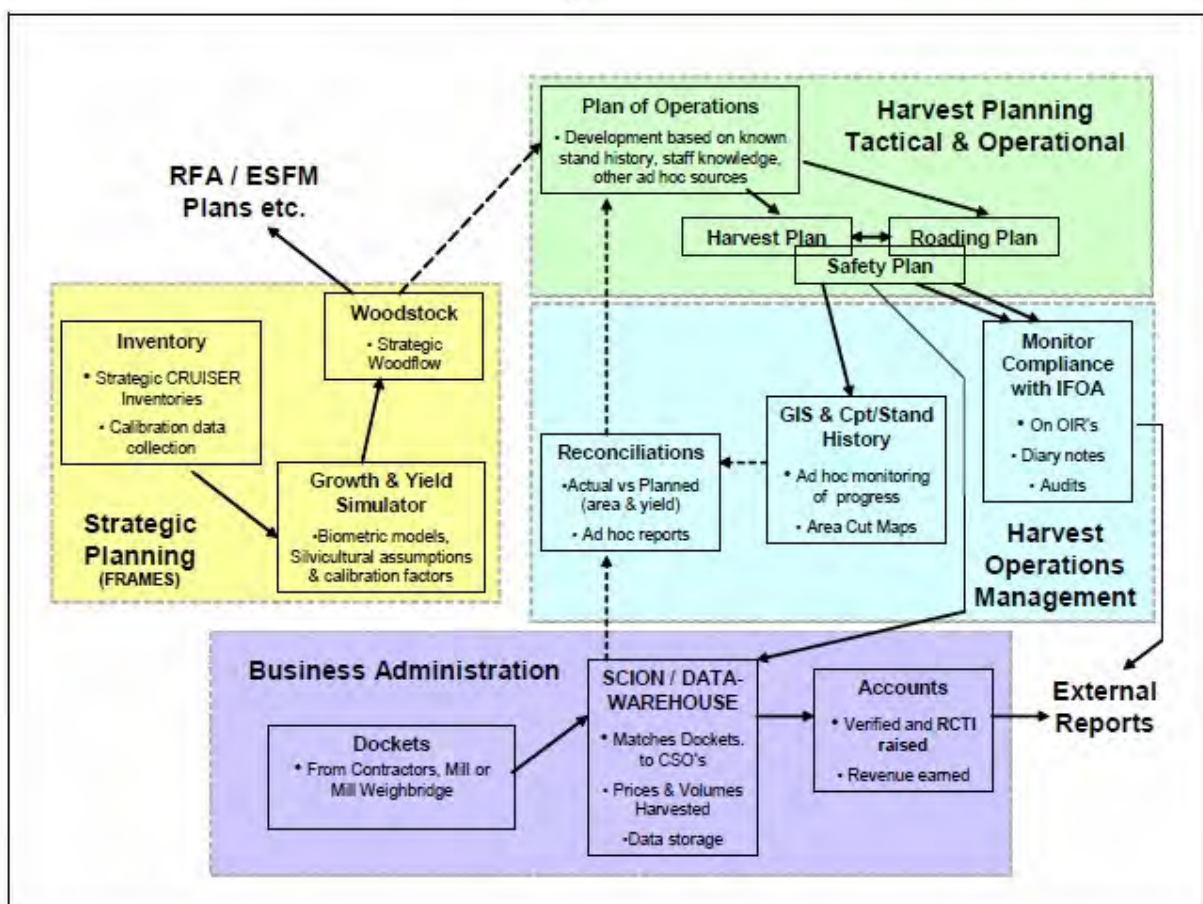
Forest estate modelling is the process of drawing together area and yield estimates within a data model and applying objectives and constraints over time in order to evaluate supply options.

This tool predicts the maximum volume that can be harvested each year over time from the total area available for harvesting, using specific silvicultural prescriptions and various conservation protocols.

FRAMES has been constructed to allow a large number of variables to be specified by the user. For example, the user can determine the types of silviculture, how many trees of what size can be harvested at any one time, what conservation protocols apply to harvesting, and what long-term constraints apply to the volumes to be harvested. All such parameters were negotiated as part of the RFA process.

As noted above, FRAMES was developed to address annual supply volumes at the RFA regional level. It is currently being adapted with a view to developing a significantly finer resolution by additional inventory and a range of component models at subregional levels where analysis will be targeted for subregions with areas between 15 and 20 thousand hectares. All such improvements will contribute to refined assessment of log volumes at subregional levels. The flowchart (Figure 4.2) below describes how FRAMES is integrated into Forests NSW management systems.

Figure 4.2: Integration of FRAMES into Forests NSW management systems



FRAMES development and enhancements

An independent review of the FRAMES system and processes on the North Coast was conducted by Professor Vanclay of Southern Cross University in 2002 – *Review of Projected Timber Yields for the NSW North Coast (2002)*. This included some early enhancements to FRAMES and set the direction for future work priorities that have now been completed. Details of these developments and enhancements are listed below by project area.

Improvements to FRAMES tools

By the end of 2006, Forests NSW had completed a broad series of improvements to its statewide (except Eden region) FRAMES modelling, including:

- a) Biometrics:
 - Growth models have been updated for all areas using recent permanent growth plot measure data.
 - Models have also been simplified to improve robustness with respect to implementation and testing.
 - Further data were collected and analysed to improve the recovery factors, volume functions, taper functions, height/diameter functions and tree product prediction model.
- b) Growth and yield simulation:
 - FRAMES has been adapted to report species-level yield trends
 - Changes have been made to the modelled product mix to provide more realistic and flexible product categories.
 - The simulation tool has been integrated with the inventory and forest-estate modelling tool to improve efficiency and user-friendliness.
 - New reports have been developed that include the profiles of average pre- and post-harvest stand states for plots that meet the harvest criteria. This report can be used by regional staff to ground-truth the modelled harvest specifications.
 - Silvicultural and harvesting assumptions have been updated as a result of silviculture studies on the North Coast.
 - New more detailed log level reports have been incorporated into the growth and yield simulation process, enabling precise log-level data to be incorporated into FRAMES yield tables.

Area management

Due to the complex nature of net area management and the large number of spatial inputs to area modelling, Forests NSW has restructured its strategic net area management toolkit. This has resulted in the development of a grid-based area prediction tool for North Coast regions. The new modelling environment permits layers that contribute to area availability to be easily extracted and updated as new data becomes available.

Forest estate models

Developments include:

- changes from Spectrum and StandSim¹¹ (which were used in the RFAs) to the Woodstock¹² forest-estate modelling system to facilitate more reliable and efficient yield-scheduling and reporting at a range of spatial levels
- inclusion of resource growth and yield estimates defined at a subregional level to support planning and monitoring activities, and
- modification of the model to ensure that only appropriate silvicultural intensities are applied to defined management areas.

Eden-specific tools

Noting an organisational shift from Spectrum and StandSim to Woodstock for yield scheduling, the outputs from REDEN¹³ (Regrowth in Eden), is an inventory-plot management and yield simulation tool, have been formatted so they can be incorporated into the Woodstock package.

The initial analysis from REDEN and Woodstock focused on short-to-medium-term timber availability issues, notably the current 20 year planning horizon, corresponding with the RFA and Wood Supply Agreement (WSA) periods. Following evaluation and refinement of the preliminary results, the system was then expanded to incorporate longer-term modelling of the resource, bringing it in line with other FRAMES models to consider a full 200-year strategic planning horizon. This work is still in progress with the current focus being on sensitivity analysis of the outputs.

Conclusion

Forests NSW will continue to review the utility of these and other tools for informing future management decisions.

Documentation

Not applicable

Review conclusion

Underway

¹¹ STANDSIM was used as the Scheduling Tool in the Eden RFA

¹² Woodstock is a linear programming tool used for estate modelling. Woodstock draws together area and yield estimates using specific silvicultural prescriptions and conservation protocols. It applies objectives and constraints within this framework in order to evaluate supply options. The output from the Woodstock tool is the maximum volume that can be harvested each year over time from the total area available for harvesting.

¹³ For a discussion of inventory plot management tools in Eden see milestone 49

Milestone 49

Eden RFA clause 46(f)

New South Wales to develop and implement an inventory system for regrowth forests

In time for the first five-yearly review

Eden RFA Attachment 11 (5) Dot point 4

Implementing an ongoing system of strategic inventory plot measurement as described in section 3.5 of the RFA

North East RFA Attachment 12 Part E (22) Dot point 5

Undertake additional inventory plot measurement consistent with FRAMES principles to improve the accuracy of volume estimates at the regional level, funded at \$500,000 per year for the first five years of this RFA

Southern RFA Attachment 8 Point 6 (e)

Undertake additional FRAMES plot inventory measurements

By the first five-yearly review

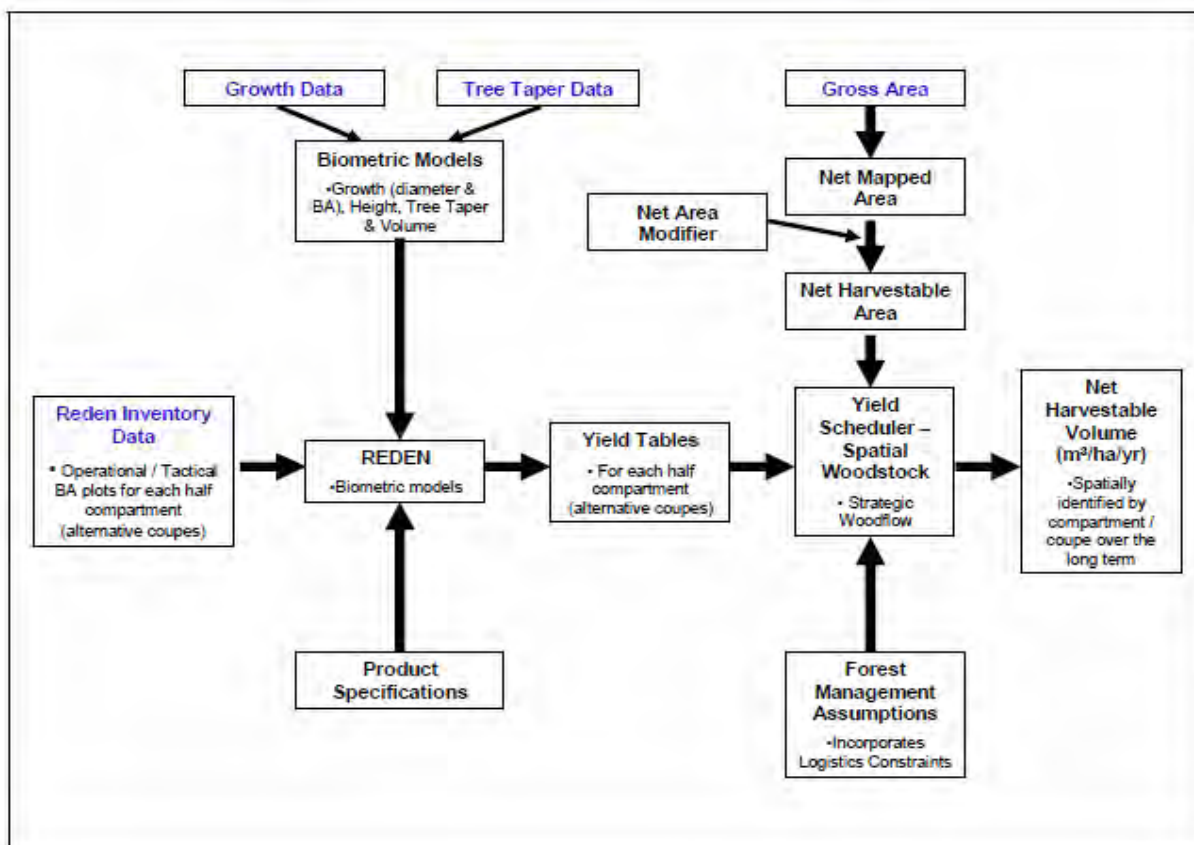
Progress of milestone

Eden region

In 2002–03 Forests NSW designed and implemented an inventory-plot management and simulation system, called REDEN, for modelling the Eden even-aged regrowth resource. The system is designed to predict individual tree and stand growth, and yield, for the even aged regrowth forests. It includes biometrics specific to the regrowth forests of south-east of NSW. The yield tables generated by REDEN are designed to be used in yield-scheduling tools for operational, tactical and forest estate level modelling.

The major drivers of the models in REDEN are stand age, site quality and the number of retained mature trees. Local taper and volume functions have also been developed which allow the input of product specifications and determination of theoretical product (high-quality sawlog and pulpwood) volumes by size. The outputs of the REDEN system are yield tables for the regrowth forest which predict the removable and retained product volumes, piece size and future growth. These results are then combined with net harvestable area estimates and used to schedule thinning and regeneration harvest operations using Woodstock (see figure 4.3).

Figure 4.3: Components of REDEN and information flows



North East region

From 1997 to 2003 there were 127 new plots established. In 2003 a full update and restructure of the sampling scheme was implemented, with additional plots measured to provide an even intensity of plots across the forest estate (1 plot each 250 hectares).

A total of 501 remeasurements for all tree attributes (eg dbh, height, new recruits, potential products) have been completed since 1998, with 96 being converted to the new plot size. Approximately half of these plots fell into the new DECC reserves and only received the one remeasure before being removed from the schedule.

Southern region

Some planning for additional inventory plots began in the Tumut subregion, but actual establishment of new inventory plots in areas harvested around Batemans Bay was completed in late 2006. Forty-one new plots were established.

There has been a FRAMES strategic inventory-plot update program completed in accordance with Forests NSW Forest Inventory Policy. Additional plots have been measured to provide an even intensity (1 plot each 200 hectares) of plots across the forest estate.

The region has remeasured all plots where harvesting had occurred as at 30 June 2006.

Forest inventory improvements

Statewide

The Forests NSW Forest Inventory Policy was released in 2004. A key feature of this policy is the systematic re-measurement of plots in areas where harvesting has occurred. The policy also includes programs to improve the biometrics used in FRAMES estimations of current and future yields.

Permanent growth and research plots

The permanent-growth plot system was re-designed in 2000–01 to reflect changes in silvicultural practices. This involved changing the plot size from 0.1, 0.3 and 0.6 hectares to 0.2 and 0.4 hectares to better capture the variability in the forests and improve data for modelling mortality and recruitment. Plot coverage has also been increased through the establishment of 270 new plots across the RFA regions.

Newly established plots in the new format were measured along with a large number of existing permanent growth plots in the new format. While improvements to current growth models are based on data from the older plot format, when data becomes available from the new plots the models will be reviewed and if necessary updated.

In the Eden region, other experiments have been undertaken by Forests NSW in conjunction with CSIRO to measure forest response to thinning regimes. These have also been used to refine biometric models in that locality.

Strategic inventory initiatives

Corporately, the MARVL (Methods of Assessing Recoverable Volume by Log types) inventory system licensed to Forests NSW by New Zealand Forest Research was upgraded and given the new name Atlas Cruiser with the inventory data converted to the Atlas Cruiser format and tree-quality sampling methodology.

Although Forests NSW has converted the inventory data from the MARVL format for North and South Coasts, the complex nature of the Cruiser data model, the long modelling horizons and inventory formats for the Eden regrowth resource have delayed consideration of usage of this system for Eden.

Forests NSW will continue to review the utility of these and other tools for informing future management decisions.

Sampling intensities were standardised at the regional level to allow for stratification and modelling flexibility. Additional plots have been measured to provide an even intensity of 1 plot in each 250 hectares in North East and 1 plot in each 200 hectares across the Southern forest estate.

Plots have been remeasured for all tree attributes in UNE, LNE and Southern regions where harvesting had been completed as at December 2006.

Calibration studies have been completed to improve the relationships between actual and predicted product yield. These relationships are used to account for the presence of unseen internal defects in native forest trees and are applied to correct the initial inventory results.

Stratification now focuses on spatially aligned local planning units (as opposed to the RFA spatially disparate forest type and structure strata) allowing model specifications and outputs to be tailored to sub-strategic levels.

Taper sampling is the destructive sampling of trees to provide stem measurement information that can be used to develop new, and verify existing, tree-volume, taper and height functions for commercial native forest species. The resulting functions are used to determine the volume of wood in trees measured in the inventory process, using the diameter at breast height over bark and mean top-height statistics. Taper data have been captured and models upgraded for the top five commercial species that contribute to high-quality large sawlogs in all regions.

A strategic inventory of the mature mixed-age forests was conducted in the Eden RFA area in 2002. Additionally, ongoing yield monitoring is used to inform yield estimates from mixed-age forests yet to be harvested. Intensive inventory of the regrowth forest estate in Eden has resulted in improved site-quality classification at the regional level.

Documentation

Not applicable

Review conclusion

Underway

Milestone 50

North East RFA Attachment 12 Part B 15

SFNSW will commission and publish and (sic) independent review of the enhanced system

By 1 December 2006

Southern RFA Attachment 8 Point 8

NSW Agrees to commission and publish an independent review of the enhanced FRAMES systems and processes applying to both the South Coast and Tumut subregions

By 1 December 2006

Progress of milestone

An independent review of the FRAMES system and processes on the North Coast was conducted by Professor Vanclay of Southern Cross University in 2002. This report is entitled *Review of Projected Timber Yields for the NSW North Coast (2002)*. The review covered the enhancements from 1999 to 2002, except for the updated inventory.

This review of the FRAMES systems and processes also meets the milestone as it applies to the Southern region.

Documentation

Vanclay, Jerome K (2002). *Review of Projected Timber Yields for the NSW North Coast*, Southern Cross University, NSW – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

North East – completed

Southern – concluded

Milestone 51

Eden RFA Attachment 11 (1)

Continuous monitoring of predicted versus actual annual product yields and component measures as described in section 3.5 of the RFA

North East RFA Attachment 12 Part E 22 Dot 6

Monitor FRAMES through comparison of actual versus predicted volumes.

Annually

Southern RFA clause Attachment 8 Point 6 (f)

Monitor FRAMES performance through comparison of actual versus predicted volumes.

Annually

Progress of milestone

The FRAMES project has been managed under a program of continuous improvement. All of these improvements are designed to refine and monitor estimates of timber sustainability over the RFA and longer-term planning horizons.

Tracking the performance of FRAMES is a difficult task. Early comparisons of actual and predicted yield were completed for the North Coast. The actual vs predicted comparisons illustrated a range of technical issues (e.g. sampling intensity) that have hindered meaningful analysis of predicted yield below the whole-of-forest-estate level, which defines the RFA outcomes. Fundamentally these relate to FRAMES being a strategic planning tool designed to predict the potential wood supply at a regional level. It is not appropriate to compare actual yields versus predicted yields at a level lower than the prediction level (i.e. the region level). Plans are in place, subject to cost-benefit analysis, to predict wood supply at a subregional level. The comparisons of actual and predicted yield were incorporated in the extensive independent review of FRAMES entitled '*Review of Projected Timber Yields for the NSW North Coast*' completed by Professor Vanclay from Southern Cross University in 2002.

Until the subregional planning project is successfully completed, the only information that is available is allowable cut (based on whole-of-region predicted yield from FRAMES) versus actual yield, which is provided for all the RFA regions in appendix 4. This draft report outlines the yields from the commencement of the RFA until the end of June 2007.

Although the performance monitoring described above may be able to identify whether yields are close to or different from predicted cut, they do not identify whether detected variation is significant with respect to sustainability or timber-supply agreements. For instance, if actual yield is less than predicted cut, it is not known whether this is because volume available for harvest was over-estimated or because harvestable volume was retained for some reason. Similarly, it is not known whether the difference is due to one part of the region being cut instead of another. To address this limitation, Forests NSW has undertaken more comprehensive monitoring work including silvicultural and net area studies and reviews that can inform both FRAMES models and management of variation in predictions or assumptions and enable these to inform future estimates.

This monitoring strategy led to the extensive independent 2002 review of FRAMES completed by Vanclay. The Timber Availability Study (TAS) that was commissioned in 2002 by the then RACD was also incorporated into Vanclay's review. The TAS study focused on the buffer-on-buffer effect on timber availability on the North Coast.

The RFA requirement to monitor timber off-take and compare it against FRAMES predictions was addressed in the Vanclay review.

Monitoring tools and databases

To improve monitoring performance, Forests NSW is integrating FRAMES into the organisation's forest management information processes. The flowchart (figure 3.2) in milestone 48 describes the information systems and linkages for native forest management.

The Social, Economic and Environmental Database System (SEEDS) was developed by Forests NSW as a central repository of information for monitoring and reporting on sustainability indicators and ecologically sustainable forest management (ESFM) values including timber products by various log categories and volumes. Information from various information systems shown are either automatically and/or manually entered into SEEDS. The following sustainability reports are produced using these data sources:

- reporting on ESFM plans
- ESFM criteria and Indicators reported in NSW FA Implementation Reports (see milestone 8), and
- Forests NSW *Social, Environment and Economic Report* (Seeing).

The same data source is used for providing sustainability monitoring for other state (*State of the Environment*), national (*State of the Forests*) and international reporting (Montreal Reporting).

Documentation

- a) For ESFM plans see:
<http://www.dpi.nsw.gov.au/forests/management/esfm>

- b) Forests NSW Social, Environment and Economic Report (Seeing) see:
<http://www.dpi.nsw.gov.au/resources/corporate-publications>
- c) Vanclay, Jerome K (2002) Review of Projected Timber Yields for the NSW North Coast, Southern Cross University, NSW – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

Concluded (with continued sustainability monitoring)

4.20. Sustainable yield and wood supply strategy

Milestone 52

<p>North East RFA clause 48(g) New South Wales to develop the strategic and operational requirements of sustainable yield systems and processes. By 1 December 2006</p> <p>Southern RFA clause 47 (g) New South Wales to develop the strategic and operational requirements of sustainable yield systems and processes. By 1 December 2006</p>

Progress of milestone

North East region

Table 4.6 summaries the wood supply estimates that resulted from the various studies completed on the north coast.

Table 4.6: Wood supply estimates from the various studies completed on the North Coast

Source of estimate	Anticipated volume in cubic metres per year for 20 years
RFA-FRAMES 1999	269,000
RACD-RFA adjusted for TAS (2002)	217,000
A Review of Wood Resources on the North Coast (2004)	220,000 for the first 5 years and then 200,000 from 6 to 20 years.

A Timber Availability Study (TAS) was commissioned in 2002 by the then RACD focusing on the buffer-on-buffer effect on timber availability on the North Coast.

Forests NSW in September 2004 released a report titled *Review of Wood Resources on the North Coast*. The report outlines the outcomes of a review of sustainable yield that was conducted to determine new North Coast supply estimates. It considered changes in area and incorporated other significant improvements in the strategic wood-supply modelling system, including net harvest area estimation, forest inventory and yield estimation. The improvements are a result of more robust inventory information, new analytical techniques, improved biometrics, and a wood-supply structure more attuned to Forests NSW operational requirements.

The revised estimates that resulted from the review are incorporated in the Indicative Schedule of Modelled Sawlog Availability which is part 6 of the publicly available ESFM plan for UNE and LNE NSW.

Southern

The sustainable yield figure used in the Southern CRA/RFA was 42,070 cubic metres for the South Coast subregion (Forests NSW 2005).

Following the RFA signoff in 2001, the government identified some minor additions to DECC reserves in 2005. Prior to finalising the new formal reserves, negotiations were completed on IFOA provisions, specifically threatened species licence (TSL) and environment protection licence (EPL) conditions, to ensure timber availability was not compromised. Internal scenario analysis and review was completed prior to the tenure change and this work confirmed that timber availability gains balanced the volumes transferred to permanent reserve.

A comprehensive review of sustainable yield using improved FRAMES for the South Coast is currently underway and is expected to be completed by June 2009.

Eden region

Following the implementation of the REDEN inventory-plot management and yield simulation system, and Woodstock yield scheduling tool in Eden in 2002–03, resource analysis work focused on short-to-medium term timber-availability issues, notably the current 20-year planning horizon of the wood supply agreements (WSA). Evaluation and refinement of the preliminary results in 2004 confirmed that the WSA yields could be maintained. The system has now been expanded to incorporate longer-term modelling of the resource, bringing it in line with other FRAMES models to consider a full 200-year strategic planning horizon. This work is still in progress with the current focus being on sensitivity analysis of the outputs.

Documentation

- a) Vanclay, Jerome K (2002). Review of Projected Timber Yields for the NSW North Coast, Southern Cross University, NSW – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- b) Forests NSW (2004a). Review of Wood Resources on the North Coast, Forests NSW, Sydney – may be viewed on the DPI Forests website at: <http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- c) Forests NSW (2005). ESFM Plan for the South Coast – Southern NSW p. 39, see: <http://www.dpi.nsw.gov.au/forests/management/esfm>

Review conclusion

North East – completed

Southern and Eden – underway

Milestone 53

Eden RFA clause 46(f)

New South Wales review the calculation of sustainable yield, using methods consistent with Attachment 11 and the principles and processes used in the Forest Resource and Management Evaluation System (FRAMES)

In time for the first five-yearly review

Eden RFA Attachment 11 Point 1

The parties to commission complete and publish a review of the systems and processes used, and the sustainable yield calculated from public land as a result of the NSW review of sustainable yield described in clause 46(f)

By the first five-yearly review

North East RFA clause 48(g)

New South Wales to implement the review and monitoring processes of sustainable yield systems and processes to enable a review of sustainable yield

By 1 December 2006

Southern RFA clause 47 (g)

New South Wales to implement the review and monitoring processes of sustainable yield systems and processes to enable a review of sustainable yield

By 1 December 2006

Progress of milestone

The *Review of Projected Timber Yields for the NSW North Coast 2002* by Professor Vanclay reviewed the sustainable yield calculations. Results from the Timber Availability Study (TAS) were incorporated into an extensive independent review of FRAMES and sustainable yield completed by Professor Vanclay in 2002. The revised sustainable yield outlined in the *Review of Projected Timber Yields for the NSW North Coast (2002)* was 220,000 cubic metres.

See summary at milestone 52 for details of timber resource analysis in the Southern and Eden regions. This analysis is still being undertaken, so no review has occurred.

Documentation

Vanclay, Jerome K (2002). *Review of Projected Timber Yields for the NSW North Coast, Southern Cross University, NSW* – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

North East – completed

Southern and Eden – underway

Milestone 54

Eden RFA Attachment 5 Point 2(h)

New South Wales to publish a description of the methods and results of calculating sustainable yield on public land

By the first five-yearly review

North East RFA Attachment 6 2(e)

New South Wales to publish a description of the methods and results of calculating sustainable yield on public land

By 1 December 2006

Southern RFA Attachment 6 Point 2 (e)

New South Wales to publish a description of the methods and results of calculating sustainable yield on public land

By 1 December 2006

Progress of milestone

As discussed at Milestones 52 and 53 a description of the methods and results of calculating sustainable yield are contained in Vanclay (2002) and Forests NSW (2004b, 2004c) reports.

Work is continuing in the Southern and Eden regions.

Documentation

- a) Vanclay, Jerome K (2002). Review of Projected Timber Yields for the NSW North Coast, Southern Cross University, NSW – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>
- b) Forests NSW (2004a). Review of Wood Resources on the North Coast, Forests NSW, Sydney – may be viewed on the DPI Forests website at:
<http://www.dpi.nsw.gov.au/forests/management/reporting/rfa-review-report>

Review conclusion

North East – completed

Southern and Eden – to be done

Milestone 55

Eden RFA Attachment 5 Point 2(h)

New South Wales to publish independent audits of Sustainable Yield as outlined in Attachment 11
For the second and subsequent five-yearly reviews

Eden RFA Attachment 11 Point 2

New South Wales to undertake, complete and publish independent audits of sustainable yield
In time for the second and subsequent five-yearly reviews

North East RFA Attachment 6 2(e)

New South Wales to publish independent audits of sustainable yield as outlined in attachment 12
For the second and subsequent five-yearly reviews

North East RFA Attachment 12 Part E 23

NSW will undertake independent audits of the progress of the sustainable wood supply strategy
To be completed in time for the second and third five-yearly reviews

Southern RFA Attachment 6 Point 2 (e)

New South Wales to publish independent audits of sustainable yield as outlined in attachment 8
For the second and subsequent five-yearly reviews

Progress of milestone

Not required until the second five-yearly review but approach is being considered.

Documentation

Not applicable

Review conclusion

Not required until second five-yearly review

4.21. Volume review

Milestone 56

North East RFA clause 81

NSW to review ... Wood supply

By 1 December 2006

North East RFA clause 83

Changes in contracted volumes following review to be incorporated in this RFA and wood supply
agreement holders to be advised

By 1 December 2006

North East RFA Attachment 12 Part B 15

SFNSW will review the timber and annual volume to be harvested from 2007–18

By 1 December 2006

Progress of milestone

Changes to contracted volumes in the North East region were made following the transfer of lands
facilitated by the *National Park Estate (Reservations) Act 2003*. Subsequent changes to the wood

supply agreements were negotiated and finalised with industry in 2005 and have extended the commitment period from 2018 to 2023. The new volumes in the wood supply agreements are listed in table 4.7. Original volumes as per the RFA are outlined in table 4.8. See also appendix 4 on actual versus allowable cut.

The new agreements were provided with a new term of 20 years (expiring in 23 years), without a review clause over the term.

To compensate for reduced volumes (and other changes) the following initiatives were put in place:

- allowing limited access of machinery into buffers in order to access more volume, while ensuring good environmental outcomes – enacted through an amendment to the integrated forestry operations approval
- purchase of private property or timber rights to supplement contracted supply
- buying back of allocations from customers where supply constraints existed, and
- changes to management zones to allow for transport subsidies.

Table 4.7: New volumes in wood supply agreements in the Eden, Southern, UNE and LNE regions

Log type	Eden (cubic metres)	Southern (cubic metres)	UNE (cubic metres)	LNE (cubic metres)
High-quality large sawlogs including veneer logs and girders	22,080	79,008	83,686	125,814
High-quality small sawlogs	1920	10,890	27,184	36,588
Low-quality sawlogs	23,000	52,062	153,677	176,867
Pulp grade and chipwood (domestic and export grade)	273,400	82,050	45,000	120,000

Note: figures include both native forest and hardwood plantations

Table 4.8: Volumes in RFAs

Log type	Eden RFA volume	North East – UNE volume	North East – LNE volume	Southern – South Coast volume	Southern – Tumut volume
Quota logs/high-quality large sawlogs (HQL) – may include large veneer logs	Minimum 25,000 cubic metres quota logs for the first five years, then 24,000 cubic metres (Eden to get 1000 cubic metres quota sawlogs from Ingebirah SF in Tumut)	HQL harvest 109,000 cubic metres (plus 20,000 cubic metres to come from LNE region)	HQL harvest 160,000 cubic metres (but 20,000 cubic metres goes to UNE region)	HQL 48,500 cubic metres	HQL 48,000 cubic metres (an additional 1000 cubic metres from Ingebirah SF in Tumut to go to Eden RFA region)
High-quality small sawlogs	-	Will be supplied at 1999 levels or greater	-	4850 cubic metres	3085 cubic metres
Low-quality sawlogs (LQS); other forest products (OFP)	Non-quota sawlogs 23,000 cubic metres (from pulp)	OFP – Existing supply arrangements and future supply		OFP – in accordance with current and future demands	
Pulpwood/pulp-grade timber	345,000 tonnes	30,000 tonnes	152,000 tonnes	97,000 tonnes	-

Documentation

- Amendments to the Integrated Forestry Operations Approvals can be found at: <http://www.environment.nsw.gov.au/forestagreements/edenagreement.htm>
<http://www.environment.nsw.gov.au/forestagreements/southernagreement.htm>

- <http://www.environment.nsw.gov.au/forestagreements/UNEAgreement.htm>
<http://www.environment.nsw.gov.au/forestagreements/Ineagreement.htm>
- b) *National Park Estate (Reservations) Act 2003* see:
[http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20\(Reservations\)%20Act%202003%20No%2024%22&nohits=y](http://www.legislation.nsw.gov.au/scanview/inforce/s/1/?TITLE=%22National%20Park%20Estate%20(Reservations)%20Act%202003%20No%2024%22&nohits=y)

Review conclusion

Completed

4.22. Contract volumes and long-term wood supply contracts

Milestone 57

Southern RFA Attachment 11 Point 7

NSW will have long-term wood supply contracts in place for South Coast and Tumut

By 1 January 2001 and 1 January 2002 respectively

Progress of milestone

Agreement on Tumut subregion customer contract was completed on 12 November 2003.
Agreement on South Coast subregion customer contract was completed on 24 November 2003.

Documentation

Not applicable

Review conclusion

Completed

4.23. Production of timber products

Milestone 58

North East RFA Attachment 12 Part E 22 Dot 4

Report on the annual production of all timber products

Annually

Southern RFA Attachment 8 Point 6 (d)

Report production of all timber products

Annually

Progress of milestone

Information on production of all timber products is reported each year in the annual report on the NSW FAs (see milestone 8).

Document

NSW FA Implementation Reports (Annual Reports) can be found at:
<http://www.environment.nsw.gov.au/forestagreements/monitoring.htm>

Review conclusion

Completed

4.24. Model to predict recruitment and maintenance of habitat trees

Milestone 59

North East RFA Attachment 8 1(q)

NSW will develop a model to predict recruitment and maintenance of habitat trees over time

By the end of 2010

Southern RFA – clause Attachment 8 Point 6 (b)

NSW will develop a model to predict recruitment and maintenance of habitat trees

By end 2010

Progress of milestone

This milestone is not due until 2010 but is under development. The draft model enables prediction of the likelihood of a tree of a particular size having hollows based on inventory or stand table data and will enable prediction of the accumulation and loss of hollow-bearing trees through the FRAMES simulator.

Based on the number of trees in any diameter class, a prediction can be made on the number of habitat trees likely to be present based on the probability of the trees developing hollows.

An initial model was prepared in 2003, and sensitivity analysis was undertaken by resource analysts in 2007. The model was updated to include proposed changes and a draft paper was provided to the *Journal of Forest Ecology and Management*. Peer review suggested some substantial revision was required and this is yet to occur. Forests NSW aims to review the model in 2009 and complete it by the 2010 timeframe.

Documentation

Not applicable

Review conclusion

Underway (but not required until second five-year review)

5. The results of monitoring of sustainability indicators

5.1. Background

Monitoring of forest management is a requirement of the NSW FAs and RFAs. Monitoring of indicators is a key part of ecologically sustainable forest management (ESFM), and aims to provide for continuous improvement in forest management practices.

Australia endorsed the *Global Statement of Principles on Forests* at the 1992 United Nations Conference on the Environment and Development held in Rio de Janeiro, Brazil. In 1993, following the United Nations Conference on the Environment and Development, Canada assembled the International Seminar of Experts on the Sustainable Development of Boreal and Temperate Forests. This led to the signing of the Santiago Declaration in 1995, and included a criteria and indicator framework — known as the Montreal Process criteria and indicators. The Montreal Process criteria and indicators are designed to reflect the ecological, economic and social components of sustainable forest management.

Regional indicators under the *Framework of Regional (Sub-national) Level Criteria and Indicators of Sustainable Forest Management in Australia* (Commonwealth of Australia 1998) form the basis for measuring and reporting on sustainable forest management in Australia.

Montreal criteria and indicators relate to seven broad areas as follows:

- biodiversity
- productive capacity and sustainability of forest ecosystems
- forest ecosystem health and vitality
- soil and water
- forest contribution to global carbon cycles
- socio-economic benefits, and
- legal, institutional and economic framework.

At the national level, the Montreal Indicators have also been used as the basis for reporting in the *State of the Forest Report* in 2003. Experience gained over the last 10 years implementing the Montreal Process criteria and indicators has enabled the indicators to be refined so that they are more meaningful for use in Australian forests. A review was conducted in 2005 and, while some indicators have largely remained as in 1998, others have changed to improve their value to forest managers and some new indicators have been introduced to improve the capacity to report against sustainable forest management.

The RFAs refer to sustainability indicators as being those indicators contained in projects undertaken as part of the Comprehensive Regional Assessments by the ESFM committee (see <http://www.daff.gov.au/rfa/publications/cra-state>). These same indicators are termed ESFM indicators in the NSW FAs¹⁴. They broadly represent the Montreal Process criteria but the indicators are slightly different for a range of reasons including:

- development of the indicators for the RFAs preceded the development of the Montreal Process criteria and indicators

¹⁴ NSW FAs are made under the *Forestry and National Park Estate Act 1998*. Information about reporting on the implementation of the NSW FAs is discussed in milestone 8 in chapter 4.

- they reflect the views of regional communities, as represented in regional forest forums, and
- they take into account DECC and Forests NSW data collection and monitoring processes.

Monitoring of the ESFM criteria and indicators began in 1999, following the implementation of the NSW FAs for the UNE, LNE and Eden regions. More recently, in May 2002 the NSW FA and IFOA were developed for the Southern region. The information collected on the indicators by Forests NSW and DECC will contribute to the evaluation of the ESFM criteria and indicators. The NSW FAs and RFAs provide for a review of the ESFM Indicators (or sustainability indicators). This is discussed at milestone 3 in chapter 4.

The ESFM indicators maintain a close link with the DECC State of the Parks reports and Forests NSW *Social Environmental and Economic (Seeing)* report.

References to the Montreal Process criteria in this document relate to the set of indicators outlined in the *Framework of Regional (Sub-national) Level Criteria and Indicators of Sustainable Forest Management in Australia* (Commonwealth of Australia 1998) rather than to the revised Montreal Process indicators (Commonwealth of Australia 2007).

The purpose of this part of the report is to outline the results of monitoring the ESFM indicators (or sustainability indicators). The monitoring is reported on a financial year basis for all regions (except Southern) from the 1999–2000 financial year as this reflects the way the data has been collected and collated. Southern region commenced reporting in the 2002–03 financial year. Where possible, data is provided to 30 June 2006, representing the most recent data available in annual reports. However, some indicators are only reported to 30 June 2004 as the way data was collected for annual reporting changed at that time.

5.2. Criterion 1: Biodiversity

Key outcomes

Implementation of the comprehensive, adequate and representative (CAR) reservation framework agreed under the RFA has resulted in an extensive system of public CAR reserves. At 30 June 2004, some 2,085,415 hectares of forest were located within DECC reserves. Key additions to the CAR reserve system over the first five years of the RFA include:

- LNE – additions to Chaelundi National Park, Guy Fawkes River National Park and Bald Rock National Park, and the gazettal of Wollumbin National Park, adjoining Mount Warning National Park
- UNE – additions to New England National Park, Barrington Tops State Conservation Area and Medowie State Conservation Area
- Eden region – the addition of Yurrammie State Conservation Area
- Southern region – additions to South East Forest National Park, Mimosa Rocks National Park, and Kybeyan Reserve, and gazettal of Brindabella State Conservation Area, Tallaganda State Conservation Area, Wereboldera State Conservation Area and Yununubeyan State Conservation Area.

The area of forest within the Forests NSW estate has remained relatively stable, except for the LNE region, where a large proportion of forest was transferred to DECC reserves due to the gazettal of lands assessed through the Northern Additions process (see section 4.7).

Over the five-year period growth in the Forests NSW forest estate appears to have remained relatively stable with most changes being the result of land transfers from the Forests NSW forest estate to DECC reserves.

Connectivity of forests has improved with the additions to DECC reserves and large numbers of voluntary conservation agreements (VCAs) and wildlife refuges on private land.

Recording of forest-dwelling species is continuing through the NSW Wildlife Atlas. At 30 June 2004, species identified as occurring on DECC reserves were as follows:

- 590 vertebrate fauna, one invertebrate fauna and 2319 vascular plant species in the UNE region
- 581 vertebrate fauna, one invertebrate fauna and 2350 vascular plant species in the LNE region
- 362 vertebrate fauna, one invertebrate fauna and 1394 vascular plant species in the Eden region
- 485 vertebrate fauna and 1198 vascular plant species in the Southern region.

The numbers of threatened species, threatened populations and ecological communities increased significantly over the reporting period. This is likely to reflect an increase in listing effort, rather than a significant change in the numbers of threatened species.

Forest type by area

Montreal Implementation Group (MIG) Indicator 1.1.a: Extent of area by forest type and tenure (UNE, LNE, Southern regions)

Indicator 1.1: Extent of forest ecosystem types and vegetation types by growth stage (Eden region)

Sub-indicator 1.1.a.1: Understorey vegetation layer (Southern region)

This criterion measures the current extent of forest cover, by forest type and growth stage, and its distribution across land tenures and reserve types. The aim of the criterion is to increase the extent of all forest types over the estimated pre-1750 levels, and to ensure a functional level of connectivity is maintained between forested areas.

Sub-indicator 1.1.a.1 provides an indication of the diversity of the understorey vegetation layer. This indicator is only required to be monitored in the Southern region. Data were not available to monitor progress against this indicator over the first five years of the review.

The Comprehensive, Adequate and Representative (CAR) reserve system was established in NSW as a result of the NSW FA and Australian Government /NSW RFA processes. The system was established in accordance with a nationally-agreed set of criteria as defined in the *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia*, prepared by the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee, commonly known as JANIS.

Changes to the extent of forest type on state forests are reported through data obtained from the forest management zoning (FMZ) system¹⁵. This zoning is based on the nationally agreed JANIS reserve criteria which give effect to the CAR reserve. The system defines a number of zones and specifies what activities are permissible within each zone.

The IUCN categorisation of protected areas is used to consider what uses might be appropriate in particular categories of reserves.

The extent of reservation of different forest vegetation communities is a measure of the degree of protection of biological diversity at the species and ecosystem levels. The modelled forest

¹⁵ Refer to Criterion 2 for greater detail on State Forests FMZ system.

type extents listed in the RFAs are used as the baseline to measure changes to the extent of forest types.

The RFA recognised three levels of reservation:

- *formal reserves* are publicly managed land tenures that cannot be revoked without Parliamentary approval
- *dedicated formal reserves* are a subset of the above and exclude mining
- *informal reserves* on public land are protected through administrative instruments.

Only minor changes to the extent of modelled forest ecosystems on DECC reserves and state forests were recorded between 1999–2000 and 2001–02. However, following the conclusion of the NSW Government’s further assessment of lands in the north east regions (known as the FMZ Assessment, or Northern Additions), some more significant changes in forest type extent (and growth stage) were recorded for each Forests NSW forest estate in the regions between 2002–03 and 2003–04 (see section 4.7).

There was a similar significant change through a number of additions to DECC reserves during 2003–04 that have resulted in the increase in the extent of a number of forest ecosystem types. A large proportion of these increases occurred within DECC reserves in the north east regions due to the gazettal¹⁶ of lands assessed through the Northern Additions process (see section 4.7). Minor changes due to the gazettal of forest areas in DECC reserves occurred in 2004–05 and 2005–06.

The area of the Forests NSW forest estate managed by Forests NSW, together with changes over the period since monitoring began is shown in table 5.1.

Table 5.1: The area of the forest estate managed by Forests NSW

Forests NSW forest estate	hectares	hectares	hectares	hectares	hectares	hectares	hectares
	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
UNE forest estate	468,212	510,552	451,224	508,388	464,715	470,449	470,867
LNE forest estate	562,020	594,607	558,141	558,141	491,293	495,827	491,999
Eden	206,466	202,178	202,495	212,154	216,107	205,545	205,544
Southern	na	na	Na	473,463	501,068	484,931	483,118

na = not applicable

The area of the forest ecosystems within DECC reserves at the end of the first five years of monitoring is shown in table 5.2.

Table 5.2: The area of forest ecosystems within DECC reserves

Forests within DECC reserves at 30 June 2004 ¹⁷	
UNE region	585,478 hectares
LNE region	622,355 hectares
Eden region	248,291 hectares
Southern region	629,291 hectares
Total	2,085,415 hectares

¹⁶ The formal process of land becoming DECC reserves by notice in the *NSW Government Gazette*.

The *State of the Parks 2004* report and ESFM annual reports provide further detail on the extent and management of forest ecosystems in each region.

Upper North East region

The UNE region covers a total area of 3,900,000 hectares. Public land comprises 33% of the UNE region, and 67% is private land.

Key additions to the Comprehensive, Adequate and Representative (CAR) reserve system in the UNE to 30 June 2006 included:

- additions to Chaelundi National Park, protecting:
 - dry foothills spotted gum, high elevation moist open tallowwood – blue gum forest types, and old growth stands of northern grassy Sydney blue gum; and
 - habitat of common bent-wing bat (*Miniopterus* spp.), glossy black-cockatoo (*Calyptorhynchus lathamii*), grey-headed flying-fox (*Pteropus poliocephalus*), masked owl (*Tyto novaehollandiae*), rufous bettong (*Aepyprymnus rufescens*), sooty owl (*Tyto tenebricosa*), yellow-bellied glider (*Petaurus australis*), and Hastings River mouse (*Pseudomys oralis*).
- additions to Guy Fawkes River National Park, protecting:
 - dry open New England blackbutt and escarpment scribbly gum – apple forest types; old growth stands of dry silvertop stringybark – apple, dry open red gum – broad leaved apple; grey gum – stringybark and New England stringybark – Blakely's red gum; and
 - occurrences of threatened plant species: *Hakea archaeoides* and *Thesium australe*, and threatened fauna species: glossy black cockatoo, speckled warbler (*Pyrholaemus saggitatus*) and brush-tailed rock wallaby (*Petrogale penicillata*).
- a 680-hectare addition to Torrington State Recreation Area, protecting the *Eucalyptus caleyi* spp. *ovendenii* ironbark and occurrences of *Macrozamia plurinervia*, *Phebalium rotundifolium* and *Hibbertia* species
- a 1344 hectare addition to Bald Rock National Park, protecting New England blackbutt forests; New England stringybark forest and woodland; and woodlands of wattle-leaf peppermint and New England peppermint
- the gazettal of Wollumbin National Park, adjoining Mount Warning National Park
- additions to Arakwal National Park protecting the Byron Bay dwarf graminoid clay heath endangered ecological community, and at least three threatened plants, including the endangered Byron Bay diuris orchid (*Diuris* sp. aff. *chrysantha*), endemic to the Byron Bay area
- addition of 4,300 hectares to Yuraygir National Park protecting large areas of heath and paperbark communities, and
- a 1400-hectare addition to the Maryland National Park protecting areas of round-leaved gum and escarpment red gum.

Lower North East region

The LNE region covers a total area of 5,799,895 hectares. Public land comprises 64% of the region, with the remaining 36% private land.

The most extensive forest types located within Forests NSW lands in the LNE region are rainforest, dry grassy tallowwood – grey gum, and wet foothills blackbutt –turpentine.

Key additions to the CAR reserve system to 30 June 2006 in the UNE include:

- 83 hectares added to the World-Heritage-listed New England National Park (15 kilometres south west of Dorrigo), protecting *Nothofagus moorei* cool temperate rainforest

- additions to the Barrington Tops State Conservation Area, protecting:
 - brown barrel – gum, and high elevation messmate – brown barrel forest types
 - occurrences of threatened plant species: *Diuris venosa*, *Euphrasia ciliolata*, fragrant pepperbush (*Tasmannia glaucifolia*), and broad-leaved pepperbush (*Tasmannia purpurascens*), and threatened fauna species: powerful owl (*Ninox strenua*), tiger quoll (*Dasyurus maculatus*), olive whistler (*Pachycephala olivacea*), eastern false pipistrelle (*Falsistrellus tasmaniensis*), broad-toothed rat (*Mastacomys fuscus*) and glandular frog (*Litoria subglandulosa*)
- additions to Medowie State Conservation Area, protecting:
 - smoothbarked apple – Sydney peppermint – stringybark forest type, and
 - threatened fauna species: koala (*Phascolarctos cinereus*), squirrel glider (*Petaurus norfolcensis*), masked owl, powerful owl, little bentwing bat (*Miniopterus australis*) and emu (*Dromaius novaehollandiae*) population of North Coast bioregion and Port Stephens local government area, and
- additions of 9300 hectares to Curracabundi and Nowendoc National Parks protecting rainforest and old growth communities.

Eden region

The Eden region covers a total area of 814,249 hectares. Public land comprises of 58% of the region, with the remaining 42% is being private. The most extensive forest types in the Eden region are Timbillica dry shrub forest, coastal dry shrub forest (*E. agglomerata*) and coastal dry shrub forest (*E. obliqua*).

Key additions to the CAR reserve system to 30 June 2006 in the Eden region include:

- the addition of Yurrammie State Conservation Area, protecting old-growth coastal foothills dry shrub forest, and
- additions of 471 hectares to the Dangelong Nature Reserve providing increased connectivity to the Kybayan State Conservation Area, and potential habitat for the brown tree-creeper (eastern subspecies) (*Climacteris picumnus victoriae*), hooded robin (south-eastern form) (*Melanodryus cucullata cucullata*); koala (*Phascolarctos cinereus*) and eastern bentwing bats (*Miniopterus schreibersii oceanensis*).

Southern region

The Southern RFA covers approximately four-and-a-half million hectares. About 45% of the region is public land, of which about 80% is forested. The remaining 55% is private land, about 30% of which is forested.

Key additions to the CAR reserve system to June 2006 in the Southern region include:

- a 195-hectare addition to the South East Forest National Park
- additions totalling 155 hectares to Mimosa Rocks National Park
- a 1219-hectare addition to the Kybayan Reserve including 850 hectares of Monaro dry grass forest and 169 hectares of montane heath
- the addition of Major's Creek to the reserve system protecting Araluen acacia herb/grass dry forest
- the addition of Macanally reserves protecting South East Tablelands dry shrub/tussock grass forests – bringing the total target achieved to 85%
- the addition of Nadgigomar to the reserve system protecting North East Tablelands dry shrub/grass forest
- the addition of Yunununbeyan State Conservation Area to the reserve system, protecting widespread tablelands dry shrub/tussock grass forest
- the establishment of the 2828-hectare Brindabella State Conservation Area, providing connectivity to Brindabella National Park and protecting Brindabella montane dry fern/grass forest and western montane dry fern/grass forest

- Tallaganda State Conservation Area (5206 hectares) protecting Eastern Tableland and Escarpment shrub/fern dry forest and Eastern Tablelands acacia/herb/grass forest
- Werboldera State Conservation Area (2249 hectares) comprising western slopes grass/herb dry forest
- Yunununbeyan State Conservation Area protecting widespread tablelands dry shrub/tussock grass forest and South Eastern Tablelands dry shrub/grass/herb forest
- additions to Deua National Park, Ellerslie Nature Reserve and Morton State Conservation Area, and
- the creation of the Monga State Conservation Area including 948 hectares of high-priority forest ecosystems, and potential habitat for the spotted-tailed quoll (*Dasyurus maculatus*) and the pale golden moth (*Diuris ochroma*).

Area of forest type by growth stage

MIG indicator 1.1.b: Area of forest type by growth stage distribution by tenure (UNE, LNE, Southern regions)

Indicator 1.1: Extent of forest ecosystem types and vegetation types by growth stage (Eden region)

This indicator is intended to reflect the general distribution of the growth stages of the different forest communities across broad land-management categories. At present, growth stage data is only available for public tenures.

The spread of age classes across forest communities is a measure of ecosystem diversity, since the structure and species composition of forest change as the forest grows older. Sustainable forest management requires the maintenance of a full range of age classes across the Forests NSW forest estate. Old-growth forest is a priority.

Forests are not rapidly changing systems, so monitoring of forest growth stages will not show large variations from year to year. The value of this indicator will be determined over time as the volume of data increases and trends can be identified. At this stage, any changes recorded from year to year will be primarily due to changes in land tenure and timber harvesting activities.

There are two broad criteria that determine growth stage classes within forests – ecological maturity (i.e. dominant age class of trees and characteristics of understorey) and level of disturbance (i.e. logging and clearing) (NPWS 1999c). Areas of forest categorised as old-growth are areas of ecologically mature forest where the effects of disturbances are now negligible (JANIS 1997).

The dominant growth stages identified in DECC reserves and state forests in the UNE and LNE regions reflect the main activities that take place within them. Forests in DECC reserves are dominated by high-conservation-value old-growth and mature forest as the land is managed primarily for conservation purposes.

Forests NSW is providing data from its FMZ system, as this provides the most accessible and accurate information on the management intent of particular successional stages within the tenure.

Approximately 50% of state forest tenure is excluded from timber harvesting. The remaining 50% is available for harvest and the growth stages will change to mature forest that has been recently disturbed, mature forest and young forest as operations proceed. Forest-growth stage data provided for state forests has been derived from its FMZ system. The most common broad forest structure classes identified on state forests are the mature and regrowth forest categories

The extent of growth stages in state forests and DECC reserves remained relatively stable between 1999–2000 and 2001–02. Following the completion of the FMZ assessment in the

UNE and LNE regions in late 2002, some larger changes in forest type extent and growth stage have subsequently been recorded in 2002–03 and 2003–04. The largest increases in growth stage extent were recorded on DECC reserves following the gazettal of a number of land transfers resulting from the *National Park Estate (Reservations) Act 2002* and the *National Park Estate (Reservations) Act 2003*. As was the case for the previous indicator (forest type), there have been some corresponding decreases to growth stage categories on state forests in the UNE and LNE regions.

The tables below report on growth stage distribution in the Forests NSW forest estate. Because the growth changes of forest within DECC reserves do not change rapidly they are not reported here. Fire can however impact on growth stages. This is reported against criterion 3.

Table 5.3: Growth stage distribution – Upper North East region

	2001–02	2002–03	2003–04	2004–05	2005–06
Forests NSW forest estate	Hectares	Hectares	Hectares	Hectares	Hectares
Rainforest	31,685	31,631	28,475	28,259	28,253
High-conservation-value old-growth	68,029	67,971	55,328	55,225	55,231
Mature forest	231,420	231,406	211,324	212,027	211,975
Regrowth forest	38,837	38,893	37,268	37,307	37,289
Young regeneration	53,670	53,667	51,742	51,758	51,798
Un-assigned	7338	7149	6302	412	6351
Totals	430,979	430,717	390,439	390,988	390,897

Table 5.4 Growth stage distribution – Lower North East region

	2001–02	2002–03	2003–04	2004–05	2005–06
Forests NSW forest estate	Hectares	Hectares	Hectares	Hectares	Hectares
Rainforest	61,178	60,845	51,020	51,345	51,396
High-conservation-value old-growth	52,450	52,308	35,886	36,070	35,867
Mature forest	179,444	178,745	157,625	158,852	158,162
Regrowth forest	113,046	111,890	98,121	100,479	101,371
Young regeneration	89,969	90,320	87,022	87,178	88,233
Un-assigned	26,465	28,030	21,582	28,234	29,946
Totals	522,552	522,138	451,256	462,158	464,975

Table 5.5 Growth stage distribution – Eden region¹⁸

	2001–02	2002–03	2003–04	2004–05	2005–06
Forests NSW forest estate	Hectares	Hectares	Hectares	Hectares	Hectares
Rainforest	2114	2127	2127	2113	2119
High-conservation-value old-growth	1460	1461	1462	1459	1458
Mature forest	64,124	64,736	64,797	64,615	64,139
Regrowth forest	58,172	58,432	58,544	58,180	58,149
Young regeneration	30,356	30,419	30,398	30,302	30,371
Un-assigned	6930	9983	11,428	7068	6919
Totals	163,156	167,158	168,756	163,737	163,155

Table 5.6: Growth stage distribution – Southern Region

	2003–04	2004–05	2005–06
Forests NSW estate	Hectares	Hectares	Hectares
Rainforest	7310	7310	6510
High-conservation-value old-growth	832	832	768
Mature forest	112,927	112,927	107,532
Regrowth forest	115,133	115,133	111,413
Young regeneration	39,602	39,602	36,496
Un-assigned	6683	6781	7398
Totals	282,487	282,585	270,117

Fragmentation

MIG Indicator 1.1.e: Fragmentation of forest types (UNE, LNE, Southern regions)

Indicator 1.2: Extent of connectivity in the forest landscape in relation to threatened species, habitat, general retained habitat on private land and conservation reserves (Eden region)

Forested areas become fragmented because land is cleared to make way for urban development, roads and infrastructure, agriculture and other human uses. The fragmentation of forested areas is a major cause of decline in biodiversity, due to factors including loss of habitat, the impact of introduced species and disease. Where areas of forest are small and isolated from other natural areas, species are unable to disperse across a wide area and this may lead to inbreeding. To prevent the long-term effects of the fragmentation of forested areas, measures need to be taken to increase the level of connectivity of these areas to assist in providing more diverse habitats and increase potential species movement.

The indicator can be used to:

- identify where connectivity needs to be restored across the regional landscape
- ensure that clearing does not increase the degree of fragmentation across tenures

¹⁸ The growth stage categories used for the DECC reserves in the Eden region are different to those applied to the North East regions (UNE and LNE). This does not allow for accurate comparison between regions.

- ensure that reserves and retained habitat incorporate the full suite of topographic and physical landscape properties, as well as biotic habitat and forest ecosystems, and
- reduce restrictions to native animal movement by optimising road-surfacing and construction and easement construction— these are being considered in the Southern region.

There are currently no formal measures by which connectivity of forested ecosystems throughout the NSW FA regions can be measured. However, additions to the formal and informal reserve system provide recognised contributions to the improvement of the overall connectivity of forested ecosystems. Various programs and activities, including voluntary incentives programs such as the voluntary conservation agreement (VCA) program, and the expansion of Forests NSW plantation estate, are contributing to the loss of fragmentation and are reported here.

Key habitats and corridors – a case study for north-east NSW

To maximise the conservation management of the NSW parks system, and to conserve biodiversity over the long term, it is necessary to facilitate species' capacities to live within and move throughout entire landscapes including reserves and the landscape habitat mosaics that surround and link them.

To provide a framework for conservation planning at a landscape scale, DECC developed a project that assessed key habitats and corridors in the north-east of NSW. For this project, key habitats are areas of predicted high conservation value for forest fauna, and include many large areas of vegetated lands and important vegetation remnants on- and off-park. A habitat corridor facilitates important ecological processes such as migration, colonisation and interbreeding of plants and animals between two or more larger areas of habitat.

The potential distributions of important forest fauna have been modelled for all land tenures across the landscape. These modelled distributions are ideal for predicting patterns in forest fauna movements and ecological processes, for use in conservation planning.

The key habitats and corridors method applied GIS-analysis tools to consolidate and integrate all the species distributions into a practical and ecologically relevant landscape context that can be represented in GIS datasets and maps. Mapping shows the important corridors for forest fauna at the regional and subregional scale that are likely to sustain the habitation and movement of populations of important fauna species, while supplementing wide-ranging, nomadic, or migratory species' habitats. Such maps can be overlaid with the predicted distributions of forest fauna assemblages to determine where the links between habitats may be insufficient.

Vegetation cover in corridors depicted in the key habitats and corridors project might not always be continuous. Mapped corridors may include smaller remnants, wetlands, roadside vegetation, groups of trees, and even individual trees, and may be broken, or fragmented by currently degraded or cleared areas. Discontinuous corridors often provide important stepping stone links and many are immediately identifiable as focus areas for habitat restoration programs.

The key habitats and corridors mapping has a number of different applications for the planning and management of parks and reserves. This mapping is used in planning to direct new roads, tracks or visitor facilities away from key habitats and corridors, to direct fire planning by guiding burning, or non-burning, regimes within key habitats and corridors for certain assemblages and to target priority areas for pest control. DECC also uses this key habitats and corridors mapping to target information and education programs for neighbours with key habitats and corridors on their lands. The mapping can help target areas for habitat restoration through the development of cooperative programs with Landcare groups or via catchment management authorities.

Forests NSW estate

Connectivity corridors are in place within state forests. This is associated with the silvicultural system adopted by Forests NSW. Forests NSW has developed, monitored and implemented connectivity across its estate. An example is the Yarrammie/Tantawangalo corridors from the coast to the escarpment. Further to this, Forests NSW has implemented the habitat connectivity provision of the threatened species licence (TSL). The elements of the threatened species licence relating to connectivity have all been implemented. Forests NSW contributes actively to connectivity through plantation and other forest establishment schemes.

Fragmentation across all of the regions was further reduced due to the establishment of new plantations by Forests NSW during the reporting period. The establishment of plantations is further reported in criterion 2, and criterion 5.

DECC reserves

An important objective of planning for long-term conservation of biodiversity is the provision of a network of protected areas where patches of habitat of suitable quality and size are connected across the landscape. Habitat corridors linking key habitats play an important role in achieving landscape connectivity. Fragmentation is still evident within the national reserves.

Fragmentation of habitats can be attributed to long (kilometres), wide (50 to 250-metre) cleared swathes through forest arising primarily from infrastructure and utility developments such as major roads, powerlines, water mains, electricity overhead cables and underground telecommunication cables. Lesser threats arise from reserve developments such as new road construction, clearance adjoining urban/industrial interfaces, and picnic areas.

Additions to the formal reserve system outlined for the previous indicator included a number of strategic areas acquired for DECC reserves during the reporting period, some of which assisted in improving perimeter boundaries of existing reserves, or the acquisition of in-holdings.

Reserve connectivity in the Southern region

Reserve connectivity in the coastal part of the Southern region is generally good with an almost continuous north to south linkage of coastal foothills and escarpment. The Southern RFA established the new Tongarra Reserve that in-fills part of an area known as the Jamberoo Gap at the southern end of the Illawarra Escarpment. East-to-west linkages between coastal and tableland reserves were established in the southern and central part of the region by the creation of Meroo National Park, Conjola National Park and an eastern extension to Morton National Park to link with Conjola National Park.

In the northern part of the coastal region, east-west protected areas are not continuous, although 'stepping stones' are apparent. This is not to say that bushland does not exist between the reserved lands in this area.

The lands between are generally unprotected lands. A vivid example of an east-to-west stepping-stone linkage is between NSW Jervis Bay National Park on the coast and Morton National Park to the west. As well as their intrinsic biodiversity values, a string of small nature reserves provide habitat across the east-west gradient. These reserves are Wollamia Nature Reserve, Saltwater Swamp Nature Reserve, Brundee Swamp Nature Reserve, Worrigeer Nature Reserve, Triplarina Nature Reserve, Bamarang Nature Reserve, Wogamia Nature Reserve, Tapitallee Nature Reserve, Colymea State Conservation Area, Bundundah Reserve and Bugong National Park. All these stepping stones are additions resulting from the finalisation of the NSW FA for the Southern region.

The lower Shoalhaven River valley landscape, around Nowra, where the above mentioned reserves occur, is an important focus for assessing connectivity options within the coastal region. DECC advises that opportunities for connectivity under a variety of protected area mechanisms should be investigated before the crucial connective native habitats are cleared.

The Jervis Bay Regional Environmental Plan is one model for retaining wildlife corridors and protected areas between conservation reserves. The Jervis Bay integrated management process managed by DECC is working towards addressing connectivity and fragmentation within the Jervis Bay area.

Private land

Private landholders play an important role in reducing fragmentation of forest areas through entering into any one of a range of voluntary conservation mechanisms. By doing so, private landholders not only help to reduce fragmentation across the landscape but also protect biodiversity values on their land.

Voluntary conservation agreements (VCAs) between private landholders and the Minister for Climate Change and the Environment protect areas of native vegetation and in so doing make an important contribution to landscape connectivity.

The Department of Environment and Climate Change (DECC) is continuing its VCA program to promote connectivity of forested areas into private land and conservation of natural and cultural values on private land. The voluntary agreements provide landholders with a means of permanently protecting the conservation values of their land by entering into a negotiated agreement with the Minister for Climate Change and the Environment. They are a mechanism that provides landholders with a means of permanently protecting the conservation values of their land and to assist in decreasing the fragmentation of forest areas.

These conservation agreements cover a range of land types from declared wilderness through to sites of Aboriginal significance and are protecting species listed as nationally endangered as well as statewide significance. Landholders with VCAs receive assistance with on-ground works, including fencing, weed control and surveys to help implement their agreements. Detailed fauna and flora surveys are conducted when assessing the suitability of an area for a VCA.

Voluntary conservation agreements

During 1999–2000, 32 VCAs were signed with property owners in NSW. In the Eden region 14 VCAs were signed in this period, mostly around the Devil's Hole area, north of Wyndham, establishing a functional habitat connection between the Tantawangalo and Yurrammie areas of the South East Forest National Park. The protection of priority ecosystem, Bega wet shrub forest and Bega dry grass forest in this corridor is of value to numerous threatened species found in and dispersing through the area such as yellow-bellied gliders, sooty owls and glossy black cockatoos.

In 2000–01, a further 2714 hectares of private land within the UNE, LNE and Eden regions were permanently protected through the establishment of VCAs.

In 2001–02, 11 VCAs were signed covering a total area of 420 hectares across the three regions.

In 2002–03, more than 645 hectares of private land in the UNE, LNE, Eden and Southern regions were protected by 19 VCAs. In June 2002, the Willow Creek Lowland Rainforest VCAs (two separate agreements) just west of Kiama in the Southern region protected an endangered ecological community – Illawarra subtropical rainforest, and two endangered plants – Illawarra socketwood (*Daphnandra* sp. C) and white wax-flower (*Cynanchum elegans*).

During 2003–04, there were 19 new VCAs covering a total area of 1458 hectares.

In 2004–05, 23 VCAs were signed (covering 1657 hectares) and 21 wildlife refuges gazetted (2696 hectares).

Although voluntary conservation agreements and wildlife refuges have continued to be established after 1 July 2005, data has not been collated for the purpose of reporting against this indicator.

Listing forest-dwelling species

MIG indicator 1.2.a: A list of forest-dwelling species (UNE, LNE, Eden, Southern regions)

Indicator 1.3.b: List of representative species by abundance. Representative sample to include threatened species, key functional groups and indicator species (Eden region)

Biodiversity is 'the variety of all life forms – the plants, animals and micro-organisms – the genes they constitute and the ecosystems they inhabit' (MIG 1998).

The maintenance of the variety of living things and the interactions between them and their environment are what make an ecosystem sustainable and healthy. By protecting and enhancing biodiversity, ecosystems as a whole can better respond to disturbance and external impacts/influences.

A decline in species diversity (flora and fauna) reduces the ability of an ecosystem to function, which in turn reduces productivity and sustainability. By monitoring any change in the diversity of forest areas, agencies have a means of identifying the impacts of current practices and forest uses. This is achieved by measuring change in forest cover (growth stage, type and extent), the location of forested areas and their proximity to other forest areas (connectivity or fragmentation), the diversity of plants and animal species and the status of these species.

Preliminary lists of forest-dwelling species occurring on state forests were first provided in 2000–01. These lists were compiled from results of various fauna and flora surveys carried out across state forests. Lists of forest-dwelling species that are monitored in state forests are at appendix 5.

DECC revises its lists of forest-dwelling species on its estate to include new information that has become available during each reporting period. These are derived from the Atlas of NSW Wildlife (the Wildlife Atlas) records from within the NSW FA regional boundaries for gazetted DECC reserves. All records that are known, or suspected, to be incorrect are not included.

Any new records occurring in the Wildlife Atlas for the current reporting year are identified, and then matched to a national list of known forest-dwelling species (from the Australian Government Department of Agriculture, Fisheries and Forestry) to identify additional forest-dwelling species. Additional species within the region that were not on the national list were also assessed to determine their forest-dwelling status.

When interpreting this data for DECC reserves, it is important to note that the final regional lists are unlikely to contain all forest-dwelling species for the region. Data are obtained from the Wildlife Atlas, which relies upon the public and government researchers contributing their observations, survey and research data for inclusion in the database. As additional records are provided to the Wildlife Atlas due to ongoing research, monitoring and survey work, the lists are expected to become more comprehensive. Since very few invertebrate species records are sent to DECC, the Wildlife Atlas has limited invertebrate records.

Significant increases in the number of forest-dwelling species within a region for a given year are often due to the contribution of large data sets, such as those resulting from research and surveys undertaken by other NSW Government agencies.

At 30 June 2004 the total number of Atlas records of which DECC was custodian was 1,334,816. At that date, a further 3,704,457 records from external organisations were also held within the Wildlife Atlas Database for internal use by DECC staff. These organisations are Forests NSW, the Australian Museum, Birds Australia, Australian Bird and Bat Banding Scheme, CSIRO, Botanic Gardens Trust (now part of DECC), the South Australian Parks and Wildlife Service, and the Queensland Department of Environment.

At 30 June 2004, species identified as occurring on DECC reserves were as follows:

- 590 vertebrate fauna, one invertebrate fauna and 2319 vascular plant species in the UNE region
- 581 vertebrate fauna, one invertebrate fauna and 2350 vascular plant species in the LNE region
- 362 vertebrate fauna, one invertebrate fauna and 1394 vascular plant species in the Eden region
- 485 vertebrate fauna and 1198 vascular plant species in the Southern region. No invertebrate fauna species were identified in the region.

Surveys for threatened species listed on schedules of the TSC Act are routinely carried out by Forests NSW to record the presence or absence of threatened species. Results of these surveys are used as an indicator of adverse and beneficial impacts of management activities on forest ecosystems. During the planning phase of forestry operations, flora and fauna surveys are undertaken to determine the presence of threatened species or their primary habitat. These surveys are carried out in accordance with the conditions of the TSL – a requirement of the IFOA.

The species recorded by these surveys determine the area of forest to be available for, or excluded from, harvesting. For example, following the sighting of particular species during pre-harvest surveys, areas of habitat are reserved from the planned area for harvesting. It should be noted that different prescriptions apply to each of the species listed under the TSL for each region.

The number of species and individuals sighted varies from year to year. The reason is that the number of threatened species depends on surveys of areas of forest scheduled for harvesting. These areas contain different forest types and therefore different species and habitat. Additionally, the season in which surveys take place affects the species sighted.

Forests NSW forest-dwelling species lists are developed through on-ground survey work, therefore any change to the number of species recorded on the estate are likely to reflect research and survey effort rather than true species richness of forest areas. These surveys represent a small component of the work undertaken by Forests NSW and the data do not include research surveys or incidental sightings in state forests. The numbers of sightings of each species is reported annually in the annual reports. These sightings reflect survey effort and are not a measure of abundance of particular species.

Other work includes calculating habitat areas so species habitat is protected from harvesting activities. Habitat areas are calculated for three representative species – koala (*Phascolarctos cinereus*), greater glider (*Petauroides volans*) and squirrel glider (*Petaurus norfolcensis*) by identifying the area of forest type and multiplying it by a figure of suitability for each species. These species were chosen because they are dependant on mature and over-mature growth stages and are susceptible to changes in forest structure.

Based on habitat models developed during the CRA which utilised forest types (identified by *Research Note 17: Forest Types in NSW*, Forestry Commission of NSW 1989) and forest structure, habitat areas for threatened species were identified within the Forests NSW forest estate. The outcomes of these models are set out in table 5.7

Table 5.7: Hectares of high-quality habitat

Species	UNE	LNE	Eden	Southern
	Hectares of high-quality habitat			
Koala habitat	171,543	106,422	792	na
Greater glider habitat	11,783	23,621	9067	na
Squirrel glider habitat	6135	4140	2	na

Status of threatened forest-dwelling species

MIG Indicator 1.2.b: The status (threatened, rare, vulnerable, endangered or extinct) of forest-dwelling species at risk of not maintaining viable breeding populations, as determined by legislation or scientific assessment (UNE, LNE, Eden, Southern regions)

Sub-indicator 1.2.b.1: The status of endangered populations and ecosystems as determined by legislation or scientific assessment (UNE, LNE, Southern regions)

This indicator monitors the status of threatened species in order to improve their conservation status and formal designation. It aims to increase the diversity of forest species, identifying those whose status is threatened. It will support the formulation of protective measures to maintain or enhance species abundance.

The TSC Act provides the legislative framework for the protection of flora and fauna species in NSW. Species of flora and fauna, populations and ecosystems may be listed for protection under schedules 1, 2 and 3 of the TSC Act.

Threatened species

The status of forest-dwelling species is most readily monitored via schedule 1 (endangered species, populations and ecological communities) and schedule 2 (vulnerable species) of the TSC Act. Critical habitat nominations are determined by the NSW Scientific Committee, and both draft recovery plans and draft critical habitat proposals are placed on public exhibition.

Submissions are considered before finalisation.

Table 5.8 provides an assessment of the numbers and status of threatened species as listed under the TSC Act and as recorded in the Wildlife Atlas as at 30 June 2006 in each region.

Table 5.8: Threatened species by region

Category of threatened species listing	UNE	LNE	Eden	Southern
	Numbers of species recorded			
Endangered vertebrate fauna	18	12	11	19
Endangered invertebrate fauna	3	1	1	0
Endangered vascular plants	84	45	23	27
Vulnerable vertebrate fauna	92	80	40	58
Vulnerable invertebrate fauna	0	0	0	0
Vulnerable vascular plants	56	71	16	29
Total	253	209	91	133

Note Endangered species are listed under schedule 1 of the TSC Act.
Vulnerable species are listed under schedule 2 of the TSC Act.

Endangered populations and endangered ecological communities

At 30 June 2006, there were 10 endangered populations listed under the TSC Act, relevant to one or more of the NSW FA regions, predominantly the UNE region. There were 44 endangered ecological communities listed that include forest-dwelling species. A full list of endangered ecological communities and endangered populations is at appendix 6 of this report.

Key listings of populations and endangered ecological communities that occurred during the reporting period, together with the relevant regions are provided below:

- littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions (UNE, LNE, Eden and Southern regions)
- New England peppermint woodland on basalts and sediments in the New England Tableland Bioregion (UNE and LNE regions)
- listing of the white box–yellow box Blakely’s red gum woodland (all regions except Eden)
- listing of the Hawks Nest and Tea Gardens koala population as endangered (LNE region)
- the lowland rainforest on floodplain in the NSW North Coast Bioregion (LNE, UNE)
- Blue Mountains shale cap forests (LNE)
- the *Glycine clandestina* (broad leaf form) population in Nambucca local government area (LNE region)
- Byron Bay dwarf graminoid clay heath (UNE)
- lowland rainforest on floodplain in the NSW North Coast Bioregion (UNE)
- tusked frog population, Nandewar and New England bioregions (UNE and LNE regions);
- McKies stringybark/blackbutt open forest (UNE and LNE regions)
- Howell shrublands (LNE region)
- Kurri sand swamp woodland in the Sydney Basin Bioregion (LNE region)
- Sydney coastal estuary swamp forest complex (LNE region)
- Sydney freshwater wetlands complex (LNE region)
- *Emu Dromaius novaehollandiae* population in the NSW North Coast Bioregion and Port Stephens local government area (LNE region)
- *Eucalyptus seeana* maiden in the Greater Taree local government area (UNE region)
- Umina coastal sandplain woodland in the Sydney Basin Bioregion (LNE region)
- Hunter lowland redgum forest in the Sydney Basin Bioregion (LNE region)

- Warkworth sands woodland in the Sydney Basin Bioregion (LNE region)
- *Eucalyptus parramattensis* subsp. *parramattensis* population in Wyong and Lake Macquarie local government areas (LNE region)
- Milton Ulladulla subtropical rainforest in the Sydney Basin Bioregion (Southern region)
- *Cymbidium canaliculatum* – orchid population (LNE region)
- ribbon gum - mountain gum - snow gum grassy forest/woodland of the New England Tableland Bioregion (UNE and LNE region)
- bangalay sand forest, Sydney Basin and South East Corner bioregions (Southern region)
- Hunter Valley weeping myall woodland of the Sydney Basin Bioregion (LNE region).

Listing of key threatening processes

During the reporting period the following key threatening process of relevance to forest-dwelling species include:

- alteration of the natural flow regimes of rivers and streams and their floodplains and wetlands
- bushrock removal
- clearing of native vegetation
- competition and grazing by the feral European rabbit, *Oryctolagus cuniculus*
- competition and habitat degradation by feral goats
- competition from feral honeybees, *Apis mellifera*
- exotic vines and scramblers
- feral pigs
- high frequency fire resulting in the disruption of life-cycle processes in plants and animals and loss of vegetation structure and composition
- importation of red imported fire ants *Solenopsis invicta* into NSW
- infection by *Psittacine circoviral* (beak and feather) disease affecting endangered *Psittacine* species and populations
- infection of frogs by amphibian chytrid causing the disease *chytridiomycosis*
- infection of native plants by *Phytophthora cinnamomi*
- introduction of the large earth bumblebee, *Bombus terrestris*
- invasion and establishment of Scotch broom
- invasion of native plant communities by exotic perennial grasses
- invasion of the yellow crazy ant
- invasion of *Lantana camara*
- loss of hollow-bearing trees
- predation by feral cats, and
- removal of dead wood and dead trees.

A full list of key threatening processes is at appendix 6.

Species extent and abundance

Indicator 1.3: Management measures in place to maintain species extent and abundance (interim for the first five years of RFA) (Eden region)

This is an Eden region indicator. For consistency of reporting, all information regarding development and implementation of management measures has been reported here for all regions. To improve species extent and abundance, a range of management measures are being developed and implemented. Key management measures discussed here are recovery planning, threat abatement planning and monitoring.

Recovery planning

During the reporting period, recovery plans were prepared by DECC for individual species listed under the TSC Act (schedules 1 and 2). During this period, recovery plans were the main planning document containing those actions necessary to maintain and secure threatened species populations and endangered ecological communities. DECC also includes management actions to ensure the conservation of all protected biota (flora and fauna) in management plans and in fire management plans for protected areas. Appendix 3 outlines the status of recovery plans.

Threat abatement planning

The TSC Act requires threat abatement plans to be developed for all key threatening processes listed under schedule 3.

The first threat abatement plan to be completed under the TSC Act was endorsed by the Minister for Climate Change and the Environment in December 2001. The *Threat Abatement Plan for Predation by the Red Fox (*Vulpes vulpes*)* (DECC 2001c) was prepared by DECC in consultation with Forests NSW, DLWC, DPI, the CSIRO, University of Sydney and the NSW Pest Animal Council. The plan details strategies to minimise the impact of foxes on threatened species such as southern brown bandicoot (*Isoodon obesulus*) and little tern (*Sterna albifrons*). A core action of the plan is a collaborative approach across all tenures. The plan is now being implemented across NSW by DECC and Forests NSW.

In the Eden region, several long-term threatened species recovery programs are being undertaken by DECC. Monitoring of the following populations continued throughout the reporting period. Monitoring programs included:

- the southern brown bandicoot program in the southern part of Ben Boyd National Park and the Waalimma section of South East Forest National Park. Numbers of southern brown bandicoot appear to be stable but remain very low
- a similar program for the smoky mouse which is continuing in the Yowaka section of the South East Forest National Park with similar results
- long-term monitoring of the ground parrot and eastern bristlebird (*Dasyornis brachypterus*) in Nadgee Nature Reserve again undertaken during 2003–04.

Of the 19 key threatening processes relevant to one or more of the NSW FA regions both predation by the European red fox, and predation by plague minnow or mosquito fish, *Gambusia holbrooki* had approved threat abatement plans by the end of the reporting period. Key threatening processes – predation by the feral cat, *Felis catus*, and invasion of native plant communities by bitou bush, *Chrysanthemoides monilifera* – had draft plans completed and were awaiting public exhibition at the end of the reporting period.

Monitoring plans

Forests NSW undertakes a range of monitoring activities, primarily through the forest biodiversity program at various locations around NSW. Outcomes included:

- a published study on the importance to wildlife of remnant old trees in eucalypt plantations
- studies on the diet, home-range and roosting preferences of forest bats
- completion of a collaborative project to publish a key to bat calls in northern NSW
- studies on the ecology and management of forest frogs, and
- completion of a report listing species and species groups likely to be sensitive to logging; prescription on state forest.

Forests NSW is also continuing to make a major contribution to nature conservation through its protected areas strategy within its forest management zoning system. This will occur through the management of formal and informal reserves, areas managed by special prescription and routine management.

Forests NSW, in consultation with DECC, has developed monitoring plans to manage threatened flora species in state forests that are locally very common and have either been observed colonising disturbed areas or appear to be otherwise resilient to disturbance. These plans require plant populations to be monitored before and after timber harvesting to determine any potential impacts or benefits.

Monitoring plans had been written and approved for five species, including the broad-leaved pepperbush (*Tasmannia purpurascens*), a distinctive plant found on the Barrington Tops Plateau in the northern tablelands of NSW and listed as a threatened species due to its limited geographical distribution. The plants regenerate vigorously in areas that have been disturbed through harvesting operations. The broad-leaved pepperbush is one of a number of threatened plant populations being monitored in the north of NSW to observe the impacts of timber harvesting.

Forests NSW has monitored bats using either banding techniques or infra-red counters at known roosts. The information gathered to date confirms that Forests NSW harvesting practices are effective in mitigating the immediate effects of logging on the bat species under study.

DECC monitors the extent and abundance of the following key species and populations:

- *Elaeocarpus* sp. *Minyon*, *Olearia flocktoniae* and *Eleocharis tetraquetra*
- populations of giant barred frogs *Mixophyes* spp.
- Bellinger River emydura *Emydura macquarii* (Bellinger River), as part of an assessment of the effectiveness of fox control methods, and
- koala populations in the burnt and unburnt country of Morton National Park at Tolwong.

Integrated forestry operations approvals

Management strategies specific to particular species are implemented in state forests under integrated forestry operations approvals (IFOAs) and attached licences made under the TSC Act, and FM Act – see criterion 7 for more information.

The terms of these licences include requirements for a variety of strategies and mechanisms to minimise the impact of forestry and related operations on threatened terrestrial fauna species, fish species and aquatic habitat. The licences require operators to:

- survey targeted species
- assess the impact of logging or roading
- prepare grazing management plans
- prepare road and fire trail management plans
- establish exclusion zones¹⁹, including riparian zones, buffers and wetlands exclusion zones
- research alternative management of exclusion zones
- meet general habitat protection condition
- meet a range of operational requirements
- meet erosion and sediment control conditions
- put in place bed and bank control mechanisms
- restrict the use of machinery within exclusion zones, and

¹⁹ Exclusion zone – an area within harvestable forest, where trees must be retained for environmental reasons, such as for the protection of watercourses.

- include protective measures such as the retention of hollow-bearing trees, recruitment trees, significant food resources, wetlands, heath, rock outcrops, caverns, tunnels and disused mineshafts.

Strategic plans for the survey and management of owls, introduced predators, the spotted-tailed quoll (*Dasyurus maculatus*) and forest frogs have been prepared through provisions of the TSL. These are in operation according to the required schedule.

Species management plans

To enable the recovery of species listed under the TSC Act, DECC and Forests NSW prepare species management plans. These plans provide specific strategies to improve the status of a particular species, to manage threatening processes, to improve habitat and reduce threats across the tenure.

Species management plans for threatened plant species are developed as required for those species where active management is necessary to ensure an improvement in conservation status. Using active adaptive management, the conditions and requirements of the IFOA will be implemented and measured for effectiveness with regard to ecological goals as part of the species management plan.

Species management plans exist for populations of threatened species at Yarrat State Forest (brush-tailed phascogale), Styx River State Forest (Hastings River mouse), Pine Creek State Forest (koala) and in the Eden region (koala). The Pine Creek Koala Management Plan was also implemented over this reporting period.

The *State of the Parks 2004* report provided a different format for the collection of this data. Table 5.9 shows the reported impact of management of threatened taxa within DECC reserves. Overall the condition of more than 50% of threatened taxa is stable, improving or secure.

Table 5.9: Management and condition of threatened taxa within reserves for each RFA region

RFA region	UNE	LNE	Eden	Southern	Total
	n=152*	n=193*	n=19	n=127	
Assessment criteria	Implementation (number of reserves)				
A planned approach to management is being implemented specifically targeting threatened taxa	57	39	8	37	141
Little or no management or only reactive management specifically targeting threatened taxa is undertaken	38	61	4	43	146
The condition of all or most threatened taxa is stable, improving or secure	87	90	12	76	265
The condition of all or most threatened taxa is declining	8	10	0	4	22
Assessment criteria not relevant as threatened taxa are not an issue or there is insufficient information to assess the impact of management on threatened taxa	57	93	7	47	204

n = number of threatened taxa

* Cathedral Rock National Park in UNE and LNE is not included in total number of parks for these regions as only partial data was provided.

5.3. Criterion 2: Productive capacity of forest ecosystems

This criterion is primarily concerned with the sustainable harvesting of both native forests and plantations. It monitors the area available for harvest in native forests and compares actual to

predicted yields to ascertain sustainability and whether set targets are being adhered to. Monitoring also extends to non-wood forest products, such as apiculture, firewood, grazing, gravel extraction, native plants and leaf products. The criterion reports on the effectiveness of plantation establishment rates and aims to promote this as a sustainable wood source. It also sets a 100% regeneration target for harvested native forests.

Key outcomes

The total area of state forest, including plantations, in the UNE, LNE, Southern and Eden regions is approximately 1.66 million hectares. The Forests NSW native forest estate covers approximately 1.29 million hectares of which some 685,000 hectares (or 53%) are estimated to be available for harvest.

Softwood plantation accounts for approximately 210,000 hectares of the total Forests NSW forest estate across all regions.

Of the total Forests NSW forest estate across all regions about 6% is hardwood plantation.

Effective stocking rates achieved by Forests NSW on its softwood plantation estate varied between regions in 2003–04. In previous years, softwood plantations had achieved an average 97% effective stocking rate. However, poor rates in the Southern and Eden regions in 2003–04 reduced the average effective stocking rate for the year to about 70%. Stocking rates have since risen to above 90%.

Available data on effective stocking rates for hardwood plantations suggest an average 95% effective stocking rate is being achieved.

Timber volumes harvested from Forests NSW native forest and hardwood plantation did not exceed the annual volumes permitted under the terms of the NSW FA and IFOA for each region over the reporting period.

The largest quantity of non-timber products extracted from state forests during the reporting period was gravel, sand and rock.

Firewood taken from state forests in 2003–04 reached a peak of almost 9520 tonnes, an increase of about 38% since 1999–2000 due to the inclusion of volumes taken from the Southern region.

Land available for timber production

Montreal Implementation Group (MIG) Indicator 2.1.a: Area of forest land and net area of forest land available for timber production (UNE, LNE, Eden, Southern regions)²⁰

This indicator is a measure of the capacity of forests to meet the market for wood products. Its purpose is to summarise changes in the area of land available for timber production over time.

Maintaining an adequate land-base for timber production is an important component in meeting the NSW RFA commitment to sustain a minimum production level of high-quality eucalypt sawlog from state forests.

The productive capacity of forest ecosystems is reliant on maintaining ecosystem processes such as water flow and quality, nutrient and carbon cycling, and interactions among species and their environment.

²⁰ Information provided for this indicator applies to state forests only. Figures reported do not include private forestry activities

Under this criterion, monitoring shows the area of forest available to provide forest materials and products, how much is extracted, and the regeneration of these harvested areas.

When interpreting the area of state forest available for harvesting it should be noted that the area of land available for harvesting does not represent the actual area of native forest harvested. The area identified for harvest can exclude land classed as historic, Aboriginal site, wildlife corridor, heath, rocky outcrop, rainforest and rare non-commercial forest type, high-conservation-value old-growth forest, filter strip or protected land.

State forests contain both timber resources and important natural and cultural values. In order to manage for a sustainable timber supply, Forests NSW apply a forest management zoning (FMZ) system. This system provides a means by which areas of state forest can be classified for harvest and conservation purposes, and is defined in the document *Managing Our Forests Sustainably: Forest Management Zoning in NSW State Forests* (Forests NSW 1999).

Within the FMZ system, there are five zones applied to native forest areas, two zones applied to plantations and one to non-forestry uses. Each zone defines what activities can be undertaken within it (appendix 7). FMZ 1 and FMZ 2 protect areas of state forest that have significant natural or cultural values. FMZ 3a protects areas for conservation purposes, and FMZ 3b only allows timber harvesting under special conditions. FMZ 3b and FMZ 4 define those areas of forest available for harvesting and set the broad guidelines under which this can occur.

The remaining zones define hardwood (FMZ 5) and softwood (FMZ 6) plantation areas, and areas set aside for non-forestry uses (FMZ 7) such as communication lines, power lines and pipelines. Areas zoned within FMZ 8 (areas for further assessment) are those that are yet to be formally classified for timber harvesting or conservation purposes. As a precaution, these areas are managed in the same way as areas zoned FMZ 3a.

Forests NSW native forest estate

The total area of state forest, including plantations, in the UNE, LNE, Southern and Eden regions is approximately 1.66 million hectares. The native Forests NSW forest estate covers approximately 1.29 million hectares. Of these 1.29 million hectares, approximately 685,000 hectares (or 53%) is estimated to be available for harvest.

Specifically, at 30 June 2006:

- Forests NSW native forest in the UNE region totalled approximately 390,000 hectares. It is estimated that 40% was available for harvest and 49% reserved for conservation purposes²¹ or unable to be harvested because of other restrictions²². It is estimated that 11% of the Forests NSW native forest estate required further assessment²³.
- Forests NSW native forest in the LNE region was approximately 458,000 hectares. It is estimated that 49% was available for harvest and 39% reserved for conservation purposes or unable to be harvested because of other restrictions. It is estimated that 12% of the Forests NSW native forest estate required further assessment.

²¹ Land for conservation purposes is classified as FMZ 1, 2 or 3A under the FMZ system described in *Managing Our Forests Sustainably: Forest Management Zoning in NSW State Forests* (SFNSW 1999).

²² The area of state forest identified as available for harvest (FMZ4) is not representative of the actual 'on-ground' area available for harvest. Harvestable areas may be subject to the conditions of the IFOAs, which protect various forest values, such as riparian filter strips and threatened species habitat exclusions. Further operational exclusions may arise due to 'on-ground findings', such as unmerchantable forest types, accessibility, rock, and low-volume areas, and these are termed 'operational exclusions'.

²³ Areas for further assessment are classified as FMZ 8.

- Forests NSW native forest in the Eden region was approximately 163,000 hectares. It is estimated that 68.5% was available for harvest and 31% reserved for conservation purposes or unable to be harvested because of other restrictions. It is estimated that 0.5% of the Forests NSW native forest estate required further assessment.
- Forests NSW native forest in the Southern region was approximately 280,000 hectares. It is estimated that around 62% was available for harvest and 38% reserved for conservation purposes or unable to be harvested because of other restrictions. It is estimated that 0.1% of the Forests NSW native forest estate required further assessment (FMZ 8).

The areas of native forest within state forests available for harvest or conserved through the reporting period are detailed in appendix 7. Note the figures and percentages outlined in appendix 7 differ from those reported above, because the data in appendix 7 includes the plantation estate, and not just native forest.

The area of Forests NSW native forest in the Eden and Southern regions has remained relatively stable since ESFM monitoring began for each region. However, for the north-east regions (UNE and LNE) some larger changes have been recorded between 2002–03 and 2003–04. These changes were mainly due to the completion of the NSW Government's FMZ assessment which resulted in the transfer of a number of Forests NSW areas to DECC.

Although these transfers largely affected lands protected within Forests NSW FMZ system and were not previously available for timber production, there has been a small decrease in the areas available for harvesting. The total Forests NSW native forest area in the UNE and LNE region decreased by about 11%.

The decrease in Forests NSW native forest occurred largely within the non-harvestable FMZ categories (FMZ 1, 2 and 3a) which decreased by 19%. Smaller decreases (2%) were recorded in the area of native forest available for harvesting.

Plantations

Softwood plantation accounts for approximately 17% or 210,000 hectares of the total Forests NSW forest estate across all regions.

The majority of softwood plantations are found in the Southern region (about 202,000 hectares). The Eden, UNE and LNE regions have around 42,000 hectares, 22,000 hectares and 17,500 hectares of softwood plantation respectively. Of the total softwood plantation estate, an estimated 68% of the area is available for harvest.

Of the total Forests NSW forest estate across all regions about 6% is hardwood plantation. These hardwood plantations are mainly found within the UNE (about 58,000 hectares) and LNE (about 29,000 hectares). It is estimated that of the total hardwood plantation estate (about 87,000 hectares), 56% is available for harvest.

Appendix 7 provides more details.

Total growing stock on timber production land

Indicator 2.1.b: Total growing stock of both merchantable and non-merchantable tree species on native forest land available for timber production (UNE, LNE, Southern regions)

No data was provided for this indicator over the reporting period.

Removal of wood products compared with sustainable volume

Indicator 2.1.d: Annual removal of wood products compared to sustainable volume (UNE, LNE, Southern regions)

Indicator 2.1.b: Annual removal of timber and non-timber products from forest ecosystems compared with those estimated to be ecologically sustainable by tenure (Eden region)

Indicator 2.1.d: Annual removal of timber products and non-timber products from forest ecosystems by volume (Eden region)

Indicator 6.1.a: Value and volume of wood and wood production (Southern region)

This indicator is used to assess the average volume of sawlogs harvested annually. It identifies the volume cut by species and the tenure of the harvested area. It is a monitoring indicator to ensure that allowable cuts are not exceeded.

Reporting against these indicators has been based on log type. Log types used for ESFM reporting are derived from the five main log type categories used by Forests NSW. The categories are based on characteristics of the timber and its proposed use:

- veneer logs
- high-quality large sawlogs
- high-quality small sawlogs
- low-quality sawlogs
- pulp-grade and chipwood timbers.

A further four categories are also used by Forests NSW. However, for purposes of ESFM reporting, these log types are described as 'other', and include poles/piles and girders, preservation logs, mining timber (round) and fencing/landscape/sleepers (sawn).

Veneer sawlogs and high-quality large sawlogs are referred to as 'quota sawlogs' as they comprise committed volumes harvested under the terms of the NSW FAs and IFOAs. Other log types do not make up committed volumes under the agreements and approvals, and are referred to here as 'non-quota sawlogs'.

Pulp-grade timbers do not form part of quota volumes except in the Eden region. Volumes are reported accordingly.

Quota pulp-grade sawlogs are for hardwood only, obtained from either native forest or plantation. State forests in the Eden region do not have any harvestable hardwood plantation areas, so all hardwood timbers are obtained from native forests.

Harvesting rates of timber across the Forests NSW estate are at appendix 8.

Quota sawlogs

Timber volumes permitted to be harvested by Forests NSW are designated in the NSW FAs, RFAs and IFOAs. An annual variation from the designated volume is permissible to accommodate changes in environmental and economic circumstances. This provision, as identified in the IFOAs, allows for harvest volumes in any one year to vary from the committed volume²⁴ by 25%, but not exceed 5% over a five-year period. Committed volumes designated in the agreements and approvals are made up of veneer sawlogs and high-quality large sawlogs²⁵, otherwise known as 'quota sawlogs'. See milestones 51 and 56, and appendix 4 for details.

²⁴ The volume of timber that may be harvested each year under the terms of the NSW FAs and IFOAs.

²⁵ Having a centre diameter under bark of at least 40 centimetres.

Quota sawlog volumes have not exceeded the permissible harvest range for any region over the reporting period (1999 for Eden and UNE and LNE, 2002 for Southern). Details are provided in appendix 8.

1999–2000

- During 1999–2000, 118,444 cubic metres representing 102% of the committed volume was harvested from native forest and hardwood plantations in the UNE.
- In the LNE region, harvesting of 124,430 cubic metres represented 98% of the committed volume of high-quality large sawlogs and veneer logs harvested from Forests NSW native forest and hardwood plantations.
- In the Eden region 23,735 cubic metres was harvested representing 103% of the allowable volume of high-quality sawlogs and veneer logs removed from the Forests NSW native forest.

2000–01

- The volume of high-quality large sawlogs and veneer logs harvested in this year from Forests NSW native forest and hardwood plantations in the UNE region was 91,254 cubic metres or 79% of the annual committed volume.
- In the LNE region, 135,845 cubic metres of high-quality sawlogs and veneer logs were harvested, representing 79% of the annual committed volume for harvest from Forests NSW native forests and hardwood plantations.
- In the Eden region 27,056 cubic metres of high-quality large sawlogs and veneer logs were harvested representing 118% of the annual committed volume.

2001–02

- During 2001–02 the volume of quota sawlogs harvested from Forests NSW native forest and hardwood plantation was 304,309 cubic metres across the UNE, LNE and Eden regions.
- Veneer and high-quality large sawlogs made up 44% (101,944 cubic metres) of sawlogs from the UNE region and 48% (177,036 cubic metres) of sawlogs from the LNE region.
- Harvest volumes of 25,329 cubic metres from the Eden region remained above 100% of the committed volume. Quota sawlogs harvested from native forest and hardwood plantations in the LNE region exceeded 100% of the committed volume for the first time in 2001–02.

2002–03

- Volumes harvested during the year were the lowest since the agreement and approval were implemented. A total of 81,860 cubic metres of quota sawlogs were harvested in the UNE region (71% of the committed volume).
- Quota sawlogs harvested from forests in the LNE region fell to 168,764 cubic metres (99% of committed volume).
- In the Eden region the volume of quota sawlogs harvested was 21,901 cubic metres.
- In the Southern region, timber harvesting under the terms of the NSW FAs and IFOAs was undertaken for the first time in 2002–03 following the implementation of the RFA and approval in May 2002. Committed harvest volumes taken from Forests NSW native forests in the region were 62,329 cubic metres of high-quality large sawlogs (65% of committed harvest volume).

2003–04

- Quota sawlogs harvested by Forests NSW in 2003–04 did not exceed volumes permitted under the terms of the agreements and approvals.
- The volume of quota sawlogs harvested in the UNE region was 76,751 cubic metres of quota (66% of committed volume). For the LNE quota sawlogs harvested were 169,762 cubic metres, representing 92% of the committed volume.

- Quota sawlog volumes harvested from the Eden region have remained above 100% of the committed volume since 1999–2000, with exception of 2002–03. Volumes rose again in 2003–04 to 26,131 cubic metres (114% of the committed volume).
- Committed harvest volumes taken from the Southern region comprised increased to 70,021 cubic metres of high-quality large sawlogs (72% of committed harvest volume).

2004–05

- Some 70,389 cubic metres of quota sawlogs were harvested from Forests NSW native forests and hardwood plantations in the UNE region (61% of the committed volume).
- For the LNE region, quota sawlogs totalled 127,539 cubic metres (77% committed volume).
- Quota sawlogs harvested from the Eden region totalled 22,434 cubic metres, representing 98% of the committed volume.
- For the Southern region, quota sawlogs totalled 53,128 cubic metres or 55% of the committed volume.

2005–06

- This year 70,333 cubic metres of quota sawlogs were harvested from Forests NSW native forests and hardwood plantations in the UNE region (representing 65% of committed volume).
- For the LNE region, quota sawlogs totalled 135,744 cubic metres (85% of committed volume).
- Quota sawlogs harvested from the Eden region totalled 23,936 cubic metres (104% of committed volume).
- Quota sawlogs from the Southern region totalled 60,673 cubic metres or 63% of the committed volume.

Quota pulp-grade sawlogs and chipwood timbers – Eden only

For the Eden region only, pulp-grade sawlogs also form part of quota log volumes. As designated in the IFOA for the region, quota pulp-grade sawlogs are calculated using a sustainable volume of 345,000 tonnes per annum. Quota pulp-grade sawlogs are hardwood only, obtained from either native forest or plantation.

There is no hardwood plantation located within the Eden region, therefore all quota pulp-grade sawlogs are taken from native forest in the region:

- In 1999–2000 a total of 352,282 tonnes, or 102% of the committed volume of pulp-grade logs was harvested
- In 2000–01, 337,434 tonnes of pulp-grade logs were harvested (108% of the committed volume).
- In 2001–02, 279,854 tonnes were harvested (81% of the committed volume).
- The volume of pulp-grade sawlogs harvested in 2002–03 was 313,870 tonnes, representing 91% of the committed volume.
- In 2003–04, 309,088 tonnes of pulp-grade logs were harvested, or 90% of the committed volume.
- The volume harvested in 2004–05 was 277,952 tonnes, or 81% of the committed volume.
- The volume harvested in 2005–06 was 294,119 tonnes, or 85% of the committed volume.

Non-quota sawlogs – native forest and hardwood plantations

In addition to quota sawlogs, a range of other sawlogs are regularly harvested from Forests NSW native forests and plantations. These are referred to as non-quota sawlogs. Most non-quota sawlogs were harvested from Forests NSW native forest.

In 1999–2000, 421,834 cubic metres of non-quota sawlogs were harvested from native forest and hardwood plantations across the UNE, LNE and Eden regions. The breakdown by region was:

- 181,656 cubic metres in the UNE region
- 234,139 cubic metres in the LNE region
- 6039 cubic metres in the Eden region.

In 2000–01, 339,237 cubic metres of non-quota sawlogs were harvested from native forest and hardwood plantations across the UNE, LNE and Eden regions. The breakdown by region was:

- 158,947 cubic metres in the UNE region
- 168,699 cubic metres in the LNE region
- 11,591 cubic metres in the Eden region.

In 2001–02, 328,641 cubic metres of non-quota sawlogs were harvested from native forest and hardwood plantations across the UNE, LNE and Eden regions. The breakdown by region was:

- 126,708 cubic metres in the UNE region
- 191,235 cubic metres in the LNE region
- 10,698 cubic metres in the Eden region.

In 2002–03, 407,707 cubic metres of non-quota sawlogs were harvested during the year. The breakdown by region was:

- 122,435 cubic metres in the UNE region
- 183,050 cubic metres in the LNE region
- 36,986 cubic metres in the Eden region
- 65,236 cubic metres in the Southern region.

During 2003–04, 411,879 cubic metres of non-quota sawlogs were harvested from Forests NSW native forest and hardwood plantation across all regions. The breakdown by region was:

- 130,063 cubic metres in the UNE region
- 202,659 cubic metres in the LNE region
- 19,765 cubic metres in the Eden region
- 59,392 cubic metres in the Southern region.

In 2004–05, 416,072 cubic metres of non-quota sawlogs were harvested from Forests NSW native forests and hardwood plantations. The breakdown by region was:

- 128,130 cubic metres in the UNE region
- 191,551 cubic metres in the LNE region
- 13,239 cubic metres in the Eden region
- 83,152 cubic metres in the Southern region.

In 2005–06, 415,977 cubic metres of non-quota logs were harvested from Forests NSW native forests and hardwood plantations across all regions. The breakdown by region was:

- 135,303 cubic metres in the UNE region
- 191,317 cubic metres in the LNE region

- 13,980 cubic metres in the Eden region
- 75,377 cubic metres in the Southern region.

Non-quota sawlogs – softwood plantations

Table 5.10 below shows the volume of non-quota sawlogs taken from softwood plantations between July 1999 and June 2004.

Table 5.10: Harvesting rates over the reporting period to 30 June 2006

Volume of non-quota sawlogs harvested from softwood plantation	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Unit	cubic metres						
UNE and LNE regions	132,350	136,726	188,438	205,731	176,039	170,785	130,424
Eden region	164,132	124,113	130,491	135,549	196,755	208,279	188,271
Southern region*	0	0	0	63,317	934,975	902,496	997,530
All regions	296,482	260,839	318,929	404,597	1,307,769	1,281,560	1,316,225

Non-quota pulp-grade and chipwood timbers²⁶

1999–2000 The volume of non-quota pulp-grade timbers harvested from native forest and hardwood plantations in the UNE and LNE regions was 165,745 tonnes. The volume of non-quota pulp-grade timbers harvested from softwood plantations was 48,960 tonnes.

2000–01 The of non-quota pulp-grade timbers harvested from native forest and hardwood plantation in the UNE and LNE regions was 272,126 tonnes. The volume of non-quota pulp-grade timbers harvested from softwood plantations was 35,571 tonnes

2001–02 Non-quota pulp-grade timbers harvested from native forest and hardwood plantation in the UNE and LNE regions totalled 111,365 tonnes. The volume of non-quota pulp-grade timbers harvested from softwood plantations was 38,359 tonnes

2002–03 Non-quota hardwood pulp-grade and chipwood timbers harvested during totalled 267,462 tonnes across the UNE, LNE and Southern regions. Non-quota pulp-grade and chipwood timbers harvested from Forests NSW softwood plantations in 2002–03 totalled 52,084 tonnes.

2003–04 209,531 tonnes of pulp-grade and chipwood timbers were harvested from Forests NSW native forest and hardwood plantation in the UNE, LNE and Southern regions (85% from native forest and 15% from hardwood plantations). These timbers have been increasingly obtained from native forests. Eighty-five per cent of pulp-grade and chipwood timbers harvested in 2003–04 were obtained from Forests NSW native forest, with the remainder from hardwood plantations.

Pulp-grade and chipwood timbers harvested from Forests NSW softwood plantation across the UNE, LNE, Eden and Southern regions during 2003–04 totalled 640,800 tonnes. Volumes harvested in 2003–04 increased significantly compared to previous years, principally due to a large increase in volumes harvested from softwood plantations in the Southern region. Pulp-grade and chipwood timbers harvested from Forests NSW softwood plantation in the Southern region accounted for more than half the total annual volume (571,634 tonnes).

²⁶ Hardwood pulp-grade and chipwood volumes for the Eden region are not included here as they form part of the quota volumes designated in the IFOA for the region. Refer to 'quota sawlogs'.

2004–05 Non-quota pulp-grade timber harvested from Forests NSW native forest and hardwood plantations in the UNE and LNE regions and native forest in the Southern region totalled 184,344 tonnes. Softwood non-quota pulp-grade timbers harvested from Forests NSW plantations totalled 639,515 tonnes, including 531,252 tonnes from the Southern region.

Non-quota pulp-grade timber harvested from Forests NSW native forest and hardwood plantations in the UNE and LNE regions and from native forest in the Southern region totalled 225,837 tonnes. Non-quota pulp-grade timbers harvested from Forests NSW softwood plantations totalled 637,264 tonnes, including 519,372 tonnes from the Southern region.

Volume of logs

Indicator 2.3: Standing volume of log stocks by species groups and diameter at breast height class for multi-aged and regrowth native forest and available for timber production by land tenure (Eden region)

No data was provided for this indicator over the reporting period.

Value of harvested logs

Indicator 6.1: Average volume and royalty value of logs harvested per annum by species and grade by tenure (Eden region)

This indicator was defined within the Eden region set of criteria and indicators under Criterion 6 – Socio-economic benefits. For continuity of reporting it has been included under Criterion 2 – Productive capacity of forests.

No data was provided for this indicator over the reporting period. This indicator has not been monitored.

Removal of products from forest ecosystems

Indicator 2.1.b: Annual removal of timber and non-timber products from forest ecosystems compared with those estimated to be ecologically sustainable by tenure (Eden region)

Indicator 2.1.d: Annual removal of timber products and non-timber products from forest ecosystems by volume (Eden region)

2.1.e: Annual removal of non-timber forest products (e.g. berries, mushrooms, game, honey, wildflowers, tree ferns and possums) compared to the sustainable level (Southern region)

These indicators are applicable to the Eden and Southern regions. However, data have been provided on the quantities of non-timber products harvested for all regions (including the UNE and LNE regions). Values of products harvested have been provided for the Eden region only.

Non-timber products are those products other than timber supplied to sawmills or processing plants that are extracted from forest areas, or for activities for which forests are utilised. These products include firewood, seeds, gravel, bark and seedlings, and activities such as beekeeping, grazing and research. This indicator summarises the outcomes of non-timber harvesting activities. Quantities of non-timber products taken from state forests in the Southern region are provided for the first time in 2002–03.

Details on all non-timber products are provided in appendix 9. A summary relating to key products is provided below.

Gravel, sand and rock

The largest class of non-timber products, by quantity, removed from state forests during the reporting period was gravel, sand and rock. In 2003–04 over 88,400 tonnes of gravel, sand and rock were extracted from state forests across the UNE, LNE and Eden regions, a 71% increase since 1999–2000. A peak of over 106,000 tonnes was reached in 2004–05.

Table 5.11: Volumes of gravel, sand and rock extracted in each region

Region	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
	Tonnes						
Eden	21,000	24,892	25,016	43,236	76,203	54,103	56,616
Lower North East	20,225	8390	4828	11,000	824	312	300
Upper North East	2916	5269	5048	0	10,388	500	0
Southern	Na	Na	Na	0	0	51,722	42
Total	44,141	38,551	34,892	54,236	88,415	106,637	56,958

na= not applicable

Firewood

Firewood taken from state forests in 2003–04 reached a peak of almost 9520 tonnes, increasing by about 38% since 1999–00 due to the inclusion of volumes taken from the Southern region from which most of the firewood taken during the year was extracted (6838 tonnes).

Table 5.12: Volumes of firewood in each region

Region	1999–2000	2001–02	2002–03	2003–04	2004–05	2005–06
	Tonnes					
Eden	691	937	935	384	865	689
Lower North East	4579	2935	1760	2000	1852	1733
Upper North East	660	770	40	297	364	125
Southern	na	na	5011	6838	4673	5786
Total	5930	4642	7746	9519	7754	8333

na= not applicable

Grazing

The total area of state forest leased for grazing across the four NSW FA regions was nearly 278,350 hectares at 30 June 2004. This is a 27% decrease in area leased since 1999–2000, despite the inclusion of the Southern region since 2002–03. All regions showed a decrease in total area leased for grazing since 1999–2000, particularly in the UNE region (53% fall by area). Only in the Eden region is an increase in grazing area evident, rising by about 16% since 1999–2000. There have been increases in most areas since July 2004.

Table 5.13: Hectares of Forests NSW forest estate used for grazing

Region	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
	hectares						
Lower North East	90,082	69,047	86,995	115,671	74,970	78,700	68,203
Upper North East	257,705	282,556	200,949	245,071	121,640	219,973	187,166
Eden – dedicated Crown Lease	3500	3436	5966	3436	3436	3436	3436
Eden – grazing permit	2051	0	0	4171	3818	3877	2193
Eden – occupation permit	1600	1440	1579	2040	1241	1408	1408
Southern	na	na	na	82,750	73,243	84,615	112,353
Total	354,938	356,479	295,489	453,139	278,348	392,009	374,759

na= not applicable

Beekeeping

The number of apiary sites has also shown an overall increase since 1999–2000, with differing trends evident by region. However, this overall increase in total apiary sites is due to the inclusion of those located in the Southern region since 2002–03, countering an otherwise decreasing trend across the UNE region and a fluctuating trend in the LNE regions.

Table 5.14: Number of apiary sites

Region	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
	Sites						
Eden	56	57	84	159	164	162	102
Lower North East	274	236	315	226	246	385	336
Upper North East	1083	1120	1084	382	393	984	980
Southern	na	Na	Na	1055	1055	1148	1193
Total	1413	1413	1483	1822	1858	2679	2611

na= not applicable

Removal of products from DECC reserves

State forests are the source of most forest products, because DECC reserves are managed principally for conservation and thus the utilisation of those forests for commercial purposes is limited.

Data available identified six beekeepers across 25 sites in the Eden region, with an unknown number of hives.

On DECC reserves in the Southern region the only non-timber forest product licensed for removal is honey. DECC issued 64 apiary licences for 324 sites for 2003–04.

Value of non-timber products in the Eden region

Table 5.15 summarises the value of non-timber products in the Eden region over the reporting period.

Table 5.15: The value of non-timber products on Forests NSW forest estate in the Eden region

	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Forest product	\$ value						
Grazing – dedicated Crown Lease	2954	2136	19,912	2136	2300	2300	2300
Grazing – occupation permit	7883	2405	3168	21,261	15,311	18,792	12,196
Grazing – grazing permit	4312	12997	0	23,941	18,864	12,792	5638
Apiculture	5998	4786	7030	8008	12,500	13,721	8131
Firewood	300	7867	8424	8453	3466	9000	6119
Wood blocks	6350	157	200	248	0	0	0
Communication sites	1288	10,087	12,540	12,383	27,303	27,800	27,878
Other structures	21,291	0	3198	2248	5469	5483	5499
Powerlines/cables/pipelines	56,000	8400	8600	8600	9000	9000	9000
Gravel / sand / rock	na	54,263	55,096	97,635	154,551	137,137	133,344
Maps sold to public	na	na	na	na	na	1267	1359

na = not applicable

Established plantations

MIG Indicator 2.1.f: Area and percentage of plantation established meeting effective stocking one year after planting (UNE, LNE, Eden, Southern regions)

Forests NSW is the largest owner/manager of plantations in NSW. Its hardwood and softwood plantations at 30 June 2004 totalled almost 377,530 hectares across the UNE, LNE, Eden and Southern regions (including harvest exclusion areas). Over half the Forests NSW plantation estate is comprised of softwood.

This indicator aims to determine the extent and effectiveness of plantation establishment. The data collected provides information on the success rate of current plantation practices. Knowing the level of success of planting helps improve practice (e.g. by better species selection). This ensures an increase in effective stocking rates.

Effective stocking rate is the survival of planted trees one year after planting at a level that promotes a cost-effective return upon harvest. Since 1999–2000, effective stocking rates achieved for both hardwood and softwood plantation established by Forests NSW has remained consistently high. However, the effective stocking rates achieved by Forests NSW on its softwood plantation estate varied between regions in 2003–04. In previous years, softwood plantations had achieved an average 97% effective stocking rate. However, poor rates achieved in the Southern and Eden regions in 2003–04 reduced the average effective stocking rate for the year to about 70%. Since then stocking rates have improved. In 2005–06, effective stocking rates for UNE and LNE were 100%, Eden was 96% and Southern 89%. In 2005–06, effective stocking rates for UNE and LNE were 100%, Eden was 96% and Southern 89%.

The plantation area established, together with the effective stocking rate is outlined in appendix 10.

Effective regeneration of harvested forest

MIG Indicator 2.1.g: Area and percentage of harvested area of native forest effectively regenerated (UNE, LNE, Eden, Southern regions)

State forests

The establishment of new planted forest and the re-establishment of existing forest after harvesting contribute to the development of a sustainable timber supply in NSW. The final productivity of a newly planted forest depends on achieving vigorous growth in the first few years. Forests NSW monitors the establishment of newly planted forest by undertaking surveys of seedling survival in the first year after planting. If survival rates are generally low or low in specific locations, the failed areas are replanted.

Since ESFM monitoring began, regeneration rates in the UNE, LNE and Eden regions have remained consistently high. Results of effective regeneration in 2003–04 were 90.5% and 100% for the LNE and Eden regions respectively. However, regeneration has not been as successful in the Southern region, with the effective regeneration rate falling from 54% to 43% between 2002–03 and 2003–04. But by the end of the reporting period, regeneration rates for the Southern region had improved considerably.

In 2004–05, regeneration rates were 100% in the UNE and LNE regions and, in the Southern region, rates more than doubled from 43% to 90%.

In 2005–06 there were no regeneration surveys in the UNE or Eden regions. Results for 2005–06 showed a regeneration rate of 100% in the Southern region and 81% in the LNE region.

DECC reserves

As a result of establishment of the CAR reserve system, some areas of Forests NSW hardwood plantation are now managed by DECC. Section 3.3 of the FAs for the UNE and LNE regions specify that these areas may be rehabilitated to their natural state by removal of the plantation trees. DECC has maintained accreditation for these plantations and has specified conditions under which such operations may proceed. The rehabilitation of these areas is to be funded by the proceeds of any harvest operation, as required by the UNE and LNE FAs. Apart from these specific requirements, there is no ongoing regeneration work because no forest is harvested in DECC reserves.

The success of native forest regeneration in reserves that were previously logged has not been systematically evaluated to date. Systematic evaluation of effective regeneration on lands previously managed by another agency is problematic, as DECC does not currently have records of past harvesting activities. As a consequence it has been, in many instances, impossible to determine the exact area harvested and subsequently regenerated.

Rehabilitation of radiata pine areas in DECC South Coast region

Most of Woodburn State Forest was acquired (2112 hectares) for Meroo National Park as a result of the RFA. Some areas contained mature pine plantations planted around 1931 and 1932. These adjoined Tabourie Lake and other high-conservation values such as threatened plant habitat of *Cryptostylis hunteriana*. Some areas of plantation were clear-felled by Forests NSW prior to dedication as national park.

After acquisition, DECC cleared approximately 60 hectares of residual pine plantation, then windrowed and burnt the residue. In 2003–04 fire was also applied to approximately 15 hectares of the plantation, where seedling regrowth was particularly dense one year after clearing activities. Natural regeneration is now occurring on many of these old plantation sites. Areas for which regeneration is proposed are currently being prepared. In 2003–04, 300 Eucalypt seedlings grown from endemic seed stock were planted over some 10 hectares adjoining the highway, to aid regeneration where windrows had been burnt.

Several photo-point monitoring sites have been established to record changes in forest structure and dominant species composition as regeneration of the old pine plantation areas proceeds.

5.4. Criterion 3: Ecosystem health and vitality

Key outcomes

Many human and non-human factors can affect the overall condition of forested areas. Such factors include pests, feral animals such as introduced predators, weeds, fire, and disease. These factors are termed negative agents.

This criterion monitors the extent of negative agents affecting forested areas. This provides information to assist in the development and implementation of effective control and management measures. The information provided by this criterion should be looked at in association with the criteria which monitor timber supply, social, cultural and recreational activities and soil and water.

Indigenous and exotic pests, pathogens and weeds, as well as such physical stresses as extreme weather events, fire, and nutritional deficiencies or imbalances, adversely affect forest health and vitality. Damage to forests from pests and pathogens, while widespread and abundant, is usually minor and of little consequence to forest health.

There is, however, an ever-present threat of pest outbreaks, disease epidemics or climatic events causing damage that is severe enough to adversely affect a forest's health and vitality. Exotic pests, pathogens and weeds are a particular concern because the natural enemies or processes that regulate their populations in their native lands are usually absent. Consequently, damaging outbreaks or epidemics can develop rapidly.

The extent and severity of these agents need to be monitored to ensure they do not degrade the environmental, social, cultural and economic values of forested areas. The ongoing monitoring of detrimental agents provides information on the impact of each agent. This information assists in setting priorities for action to reduce and/or eradicate these factors. Measures that increase forest health and vitality include eradication programs, control plans, and public education and participation programs.

The health of plantations is managed relatively intensively to protect the capital investment in their establishment and management.

Control efforts on feral animals focused on nine species across more than 1.6 million hectares in the RFA regions, but with significant effort focused on the Eden region. Key species treated included rabbits (*Oryctolagus cuniculus*), goats (*Capra hircus*), deer (*Dama dama*) and pigs (*Sus scrofa*).

Ten noxious weeds occur in state forests, including blackberry, lantana, giant Parramatta grass, crofton weed, Scotch broom, nodding thistle and mother of millions.

Bitou bush was the most significant weed species impacting DECC reserves. The extent of the weed was most widespread across the LNE region, where 20,053 hectares are identified as affected. However 67% of this area was lightly infested and the weed is only problematic at the edge of forested ecosystems.

Bell miner associated dieback is a complex phenomenon in which native forest species, particularly mature eucalypts, develop an unexplained proliferation of sap-sucking insects called psyllids. The proliferation is usually associated with declining tree health and a proliferation of bell miners or bellbirds (*Manorina melanophrys*). This is of prime concern in the northern forest regions of the state.

From 24 December 2001 to 16 January 2002, over 700,000 hectares of NSW were burnt by bushfire (NSW Rural Fire Service 2002). These very severe bushfires were followed by even worse fires in 2002–03 where over 1.45 million hectares were burnt.

The Southern region was the most extensively affected by bushfire during 2002–03 with over 751,595 hectares of DECC and Forests NSW forests burnt. About 97% (734,273 hectares) of the total area burnt in 2002–03 was within DECC reserves. State forests were not as severely affected, with only 17,322 hectares burnt, including 1000 hectares of plantation.

Animal pests

Indicator 3.1.a: Area and percentage of forest affected by processes or agents that may change ecosystem health and vitality (narrative as interim) (UNE, LNE, Eden, Southern regions)

Indicator 3.1: List of biological factors influencing forest health and vitality, including weeds, feral animals, insects and disease (Eden region)

State forests

Feral animals

Control efforts treated nine species over more than 1.6 million hectares across the regions, but with significant effort focused on the Eden region. Key species treated included rabbits, goats, deer, and pigs. The extent of feral animal control is outlined in the tables below.

Table 5.16: Forests NSW forest estate treated for feral animals by region

Extent of Forests NSW estate treated for feral animals (hectares)							
Region	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Eden	850	75,000	31,150	80,000	150,190	151,000	400
Upper North East	17,600	0	0	0	1200	1200	0
Lower North East	85,000	4000	200	7200	1025	3357	2576
Southern	na	na	na	98,000	108,086	118,200	0
Total	103,450	79,000	31,350	185,200	260,501	273,757	2976

na= not applicable

Table 5.17: Expenditure on feral animals within the Forests NSW forest estate

Expenditure on feral animals within the Forests NSW forest estate							
Region	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Eden	\$2712	\$3000	\$7992	\$6000	\$3500	\$ -	\$5050
Upper North East	\$15,000	\$-	\$ -	\$-	\$3,000	\$3,000	\$ -
Lower North East	\$1000	\$1000	\$50	\$4850	\$3725	\$30,365	\$5040
Southern	na	na	na	\$7,000	\$6,000	\$7,850	\$13,000
Total	\$18,712	\$4,000	\$8,042	\$17,850	\$16,225	\$41,215	\$23,090

na= not applicable

Introduced predators

Wild dogs (*Canis familiaris*) are the most ubiquitous predator affecting state forests; they are present across more than 1.6 million hectares in all regions.

Table 5.18: Extent of Forests NSW forest estate treated for introduced predators by region

Extent of Forests NSW estate treated for introduced predators (hectares)							
Region	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Eden	80,000	568,982	664,447	590,815	509,979	652,779	75,000
Upper North East	274,500	1000	20,500	5550	5500	25,100	25,100
Lower North East	365,000	1,012,050	528,520	56,380	43,063	54,385	53,521
Southern	na	na	na	799,588	805,348	877,734	na
Total	719,500	1,582,032	1,213,467	1,452,333	1,363,890	1,609,998	153,621

na= not applicable

The majority of the expenditure on feral animal control was directed to state forests in the Eden and Southern regions mainly to control foxes (*Vulpes vulpes*) and wild dogs.

Table 5.19: Expenditure on introduced predators within the Forests NSW forest estate

Expenditure on introduced predators within the Forests NSW estate							
Region	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Eden	\$103,416	\$206,336	\$129,266	\$93,500	\$154,700	\$122,400	\$100,993
Upper North East	\$43,500	\$4,250	\$48,000	\$57,000	\$5000	\$62,500	\$16,000
Lower North East	\$74,085	\$77,550	\$70,391	\$83,858	\$118,861	\$86,021	\$43,120
Southern	na	na	na	\$231,900	\$246,965	\$265,629	\$294,087
Total	\$221,001	\$288,136	\$247,657	\$466,258	\$525,526	\$536,550	\$454,200

Na= not applicable

Native pests

Native pests (possums and wallabies) pose a particular problem in the planted forest estate. Control activities for these species were undertaken primarily in the Eden and Southern regions.

DECC reserves

Feral animals

DECC is targeting high-priority pest issues with programs targeting areas that have high populations of pest species. Where pest issues show low-to-medium population levels they are more likely to remain untreated.

Eden region Of 17 reserves identified, six feral animal species were identified in one or all reserve areas. All identified species were extensive, being evident in most reserve areas. The fox was identified in all 17 reserves in the Eden region, with pig, rabbit and feral cat (*Felis catus*) identified in 16 of the 17 reserve areas. Goat and wild dog, evident in over half of the reserve areas, were the other species identified.

Foxes and wild dogs are of particular concern around the habitat and populations of smoky mouse, southern brown bandicoot, long-nosed and long-footed potoroo, tiger quoll and little tern.

In the Eden region, DECC is continuing long-term monitoring programs on the impact of pest control on the smoky mouse in the Yowaka section of the South East Forest National Park and small marsupials (particularly bandicoots and potoroos) in the Ben Boyd and South East Forest national parks and Nadgee Nature Reserve. Other control programs have focused on the southern Wadbilliga National Park, Bombala/Dangelong Nature Reserve, Nadgee Nature Reserve and Bournda National Park.

Southern region Significant populations of eight feral animal species occur on DECC reserves in the Southern region. These are feral cat, deer (*Cervus* spp.), wild dog, fox, goat, horse (*Equus caballus*), pig and European rabbit.

European red fox management in south-east NSW

Predation of native fauna by foxes has been listed as a key threatening process under the TSC Act and a threat abatement plan for foxes is being implemented to mitigate the impact foxes have upon identified threatened species.

Some examples of fox control being undertaken in the Southern region include:

- fox control while undertaking wild dog control programs in Brindabella National Park, Bimberi Nature Reserve, Brindabella SCA, Kosciuszko National Park, Yaouk Nature Reserve, Scabby Range Nature Reserve and Woomargama National Park;
- fox control around lambing seasons. Specific control programs were run in Kosciuszko National Park (Blowering, Cabramurra, Goobarragandra), Weriboldera State Conservation Area, Tinderry Nature Reserve, Razorback Nature Reserve, Burrinjuck Nature Reserve, Ulandra Nature Reserve, Livingstone National Park, Nest Hill Nature Reserve, Woomargama National Park and Reserve, Tabletop Nature Reserve; Weisners Swamp Nature Reserve and Benambra National Park
- fox baiting at NSW Jervis Bay National Park, Comerong Island Nature Reserve, Seven Mile Beach National Park, and Morton National Park as part of the Fox Threat Abatement Plan
- fox control as part of the Fox Threat Abatement Plan was also conducted around and between the alpine resorts and along the Whites River corridor, specifically targeting threatened species habitat such as the broad-toothed rat and mountain pygmy possum. A fox control program was also carried out around the Rawsons Pass and summit area of Mount Kosciuszko. This was done primarily to target foxes congregating in unburnt areas. Fox-baiting during the pre-lambing season was carried out in Ironmungy, Wullwye, Paupong and Bobundara nature reserves.

In other regions DECC, such as the south-west slopes, DECC is committed to monitoring the 'control' response of the threatened broad-toothed rat to fox control programs. Mundoonen Nature Reserve, for example, is part of a broader landscape survey that involves monitoring the success of fox-control methods in reducing fox density and in monitoring prey population response to fox control.

Upper and Lower North East regions Nine feral animal species were identified one or all of the selected reserves. Cats and wild dogs were identified and are distributed widely in all six reserves in the region. In all reserves both cats and wild dogs were considered of low conservation significance at present due to native species and habitat abundance, with the exception of cats in Chaelundi National Park where they have been identified as having a more significant impact on the Hastings River mouse (*Pseudomys oralis*). Foxes were identified in five of the six selected reserves, and considered of high conservation significance in two of these (Chaelundi National Park and Sherwood Nature Reserve).

Control programs have been implemented for feral pigs and goats in the Oxley Wild Rivers, Werrikimbe, Mummel Gulf, Nowendoc, Boorolong, and Mt Yarrowyck areas of the DECC estate. These programs have shown a reduction in animal numbers.

Wild dog management by DECC

The management of wild dogs on the boundaries of DECC reserves and grazing properties is a contentious issue. DECC must balance the conflicting objectives of protecting dingoes on DECC reserves and meet its responsibilities under the *Rural Lands Protection Act 1998*, which declares wild dogs as a noxious animal and therefore requires wild dogs, including dingoes, to be controlled. In DECC, all key control programs are cooperative initiatives between the department, adjoining landholders and/or rural lands protection boards. As a consequence of potential non-target impacts (e.g. spotted tailed quoll) aerial baiting of wild dogs does not occur in any of the reserves in the Southern region.

DECC participated in the South East NSW and Australian Capital Territory Wild Dog Management Project. Part of this project was an adaptive research component that trapped wild dogs to monitor their movements so that a more strategic approach to control could be developed. Scat analyses from this program were also undertaken in order to determine dietary components. Samples were taken from various locations around northern Kosciuszko National Park. From 99 samples it was found that swamp wallaby (*Wallabia bicolor*) comprised 34% of the wild dog diet, echidna (*Tachyglossus aculeatus*) 24%, rabbit 17%, wombat 12%, insects (including maggots) 11%, common brush-tailed possum (*Trichosurus vulpecula*) 10%, bird 8%, reptile 6%, and bush rat (*Rattus fuscipes*) 4%. A DNA testing program was set up in conjunction with the University of NSW. Of the 89 animals tested, 17% were most likely pure dingoes, 60% were definitely hybrids, 8% were possibly pure dingoes and 16% were most likely hybrids.

Wild dog attacks and stock losses in the Snowy Mountains area have decreased significantly over the reporting period which is being attributed to the comprehensive trapping and baiting programs that have been in place over the past two years. Even after recent fires when dog movements increased in most areas, staff and contractors were able to quickly address the problem by trapping, with few stock losses. Regional staff have been working with the community and rural land protection boards to develop local area wild dog management plans which will further consolidate wild dog programs in all areas and monitor their effectiveness into the future.

DECC has made a commitment under the South Coast Wild Dog Plan to conduct a wild dog baiting program in Kybeyan Nature Reserve and State Conservation Area. A total of 25 baiting stations will be maintained along the Kybeyan Fire Trail from the Kydra River southwards to Dandelong Nature Reserve. DECC is undertaking cooperative fox and wild dog management programs with the community, Rural Land Protection Board, and Forests NSW in the Tilba, Badja and Wadbilliga areas. A cooperative wild dog/fox control plan has been written and is being implemented in the Brindabella and Wee Jasper Valleys. Wild dog/fox control plans were also being prepared for the Yaouk and Shannon's Flat areas and Goobarragandra, Gilmore Valley and Adjungbilly areas.

Noxious and environmental weeds

State forests

Ten noxious weeds occur on Forests NSW lands, including; blackberry, lantana, giant Parramatta grass, crofton weed, Scotch broom, nodding thistle and mother of millions. The most significant infestation of a weed species was of lantana. Forests NSW estimates approximately 162,400 hectares of state forest in the UNE and LNE regions are affected by the weed.

The most significant infestation of a weed species was of lantana with approximately 152,400 hectares of state forest in the LNE affected by the weed and some 10,000 hectares in UNE. Less than one hectare was identified in the Eden region.

The expenditure over the reporting period for noxious and environmental weeds is shown below.

Table 5.21 Expenditure on noxious and environmental weeds within the Forests NSW estate

Region	1999–2000	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Eden	\$20,974	\$55,778	\$30,320	\$500	\$68,600	\$86,500	\$72,205
Upper North East	\$70,037	\$25,592	\$34,300	\$77,147	\$325,589	\$215,520	\$21,500
Lower North East	\$119,788	\$91,765	\$101,157	\$275,005	\$309,851	\$162,948	\$90,600
Southern	na	na	na	\$87,400	\$91,275	\$185,500	\$211,790
Total	\$210,799	\$173,135	\$165,777	\$440,052	\$795,315	\$650,468	\$396,095

na= not applicable

DECC reserves

For DECC, the management, suppression and control of weeds are significant challenges to the sustainability of conservation values in the reserve system. Important factors include disturbance by fire (e.g. leading to spread of lantana), a large adjoining human population, pest ecology, and delays in targeted management. In some reserve areas weed infestation is chronic and will require concerted, targeted effort to control, and a particular focus on rare and vulnerable ecosystems or other reserve values that are being affected.

Integrated weed management is likely to result in the most effective long-term reduction in weed populations and to avoid selection of herbicide-resistant weeds. DECC incorporates biological control into programs where effective agents are available, but in most cases biocontrol must be supplemented with conventional control techniques. The weed management approach adopted by DECC reflects a balance between the desire to use the most effective control technique and a requirement to minimise non-target impacts.

Eden region

In the Eden region, approximately 50 hectares of park or reserve were affected by weeds. This equates to 0.0002% of the 247,763 hectares of DECC reserves.

The 50 hectares of weed infestation was primarily fireweed (*Senecio madagascariensis*), serrated tussock (*Nasella trichotoma*), willows (*Salix* spp.) and pine wildlings. Willows have largely been removed along the Genoa River in the South East Forest National Park and from most of the Brogo River catchment in Wadbilliga National Park. Major programs to complete the removal of willows in the park will continue to reduce the extent of this species within national parks in the Eden region to an insignificant area.

Upper and Lower North East region

In the UNE and LNE region, which includes many of the priority sites for bitou bush in NSW, the control of bitou bush is one of the highest-priority weed programs for DECC's northern branch. Bitou bush covers 900 kilometres of NSW coastline with priorities for control being protection of rare and threatened species, low infestation levels, reduction of large and dense infestations and cooperative programs with neighbours and community groups. Helicopter spraying treated large infestations in Moonee Beach Nature Reserve (50 hectares), Yuraygir National Park (104 hectares) and Bundjalung National Park (434 hectares) and 212 hectares on the Tweed Coast. Ground control in these reserves is used in sensitive environments. Monitoring has demonstrated the effectiveness of the program and the area requiring treatment was greatly reduced in 2004.

Lantana occurs in most coastal and eastern escarpment parks from Narooma to the Queensland border. It is a very vigorous and invasive species, and hence has been listed as a Weed of National Significance. In Nymboida National Park, infestations occur along the entire length of the Mann River and range from isolated clumps to large areas of impenetrable, highly competitive thickets.

Southern region

An inventory of weeds by DECC in the Southern region indicates that 102 weed species are recognised as pests in this region. The database lists a total of 1127 weed issues of which 31% were being treated at 30 June 2004 and 69% were untreated. Of the untreated weed issues, 37% are at low-infestation levels in the reserve, 12% were at moderate levels and 7% were at high levels. Of these weed issues, 44% were at unknown levels of infestation. Priority weeds on DECC reserves in the Southern region have been bitou bush, willows, serrated tussock, and now sea spurge (*Euphorbia paralias*), lantana and kikuyu (*Penisetum clandestinum*).

Controlling blackberries in southern NSW

One of Australia's worst weeds, blackberry, is being targeted in a trial biological control program near Tumberumba and Tumut in southern NSW. Blackberry can thrive in a wide range of conditions, quickly invading and dominating river banks, bushland, plantations and farming land.

The trial to assess the effectiveness of new 'rust' strains in controlling blackberry has been undertaken by CSIRO with the financial support of the Riverina Highlands Weeds Working Group, of which Forests NSW is a member.

Secretary of the working group, Kylie Durant, said the 'rust' was a type of fungus, *Phragmidium violaceum*. 'Earlier fungal strains were released in the 1980s, with variable results due to resistance of some of the blackberries to the strains, and unfavourable environmental conditions,' she said. There are at least 15 different varieties of European blackberry in Australia.

The CSIRO laboratory in France has established a garden of Australian blackberry genotypes to 'trap' new strains of the rust that specifically infect them. This resulted in eight new strains being imported and tested for host-specificity in a high-security containment facility in 2002, with the new strains approved for release in February 2004. CSIRO then conducted seven releases at trial sites across the region, including some sites on state forests.

'DNA samples from the trial sites have been collected and work is continuing on developing techniques to differentiate the new European strains from the existing populations of the rust, and to assess effectiveness,' Kylie said.

'The next step is to continue to improve the efficiency of the methods to mass-produce the rust and develop a delivery system for future large-scale releases, as well as continuing to monitor the trial site'.

Forests NSW (2005)

Disease and physical agents

State forests

Disease, pests, fungi or physical agents can severely affect the biodiversity of an area and its future productivity by limiting growth rates and affecting the overall health of trees. As Forests NSW invests a significant amount in the establishment of planted forests each year, the management of pests and disease is crucial to ensure the trees remain healthy and productive. As part of its plantation establishment program, regular surveys are undertaken to monitor the extent of the main negative agents affecting the planted Forests NSW estate. Data are collected annually on the occurrence of the main threatening biological agents and critical nutrient deficiencies in both hardwood and softwood plantations. The data are used as a planning tool for eradication and control measures.

Surveys are carried out for all agents, but only four selected groups of agents are regularly reported in hardwood plantations (herbivorous and sap-sucking insects, leaf and shoot fungi, stem borers and soil pathogens) and five agents in softwood plantations (pine needle blight *Dothistroma pini*, fungus *Sphaeropsis (Diplodia) sapinea*, boron deficiency, Sirex wood wasp *Sirex noctilio* and possum damage).

The most extensive agent in 1999–2000 was boron deficiency, but by 2004–05 its occurrence had decreased to less than 0.01%.

The area of hardwood plantation affected by leaf and shoot fungi and soil pathogens remains low. Although severe defoliation has been caused by leaf fungi, such as *Phaeophleospora*

epicoccoides, these are only in small, localised areas. Damage from stem borers remains low at an estate level, although can be significant at a local level.

In addition to surveys for physical agents affecting state forests, Forests NSW also conducted surveys to determine the extent of soil pathogens (e.g. *Phytophthora cinnamomi* and *Armillaria* spp.) within its planted forest estate. Results of these surveys did not identify any soil pathogens within the survey area in any region during 2000–01.

Monterey pine aphid (*Essigella californica*) continues to have an extensive impact upon softwood plantations. This has been the most extensive agent since 2004–05 and is estimated to affect around 25% of the softwood estate (up from 15% in 2004–05). The aphid can significantly reduce growth rates by causing discolouration of leaves and loss of needles.

Upper North East and Lower North East regions

The area of softwood plantation affected by *Dothistroma* reached high levels in several areas, such as the Northern Tablelands in 2001–02. However, there was been a marked decrease in *Sphaeropsis* fungus infestation between 1998–99 and 1999–2000, and incidence of infestation has continued to gradually decrease since then.

Results of surveys indicated 3.1% of post-1995 hardwood plantations in the UNE and LNE regions were affected by herbivorous insects (2.8%) and stem borers (0.3%). However, the extent of herbivorous insects decreased by 85% from 1999–2000. Surveys conducted during 2000–01 identified 560 hectares affected across the UNE and LNE region hardwood plantations, compared with 3910 hectares in 1999–2000. The extent of stem borers increased by 32% (19 hectares) during 2000–01.

A decrease in the occurrence of boron deficiency in the UNE and LNE regions was attributable to the success of remedial fertilisation undertaken by Forests NSW on affected stands. This work reduced the area affected from 72 hectares in 1999–2000 to nil in 2000–01.

While *Sirex* wood wasp increased in extent across all regions, the increase was most severe in the UNE and LNE regions. The area affected increased from two hectares in 1999–2000 to 4300 hectares over the reporting period.

Bell miner associated dieback

Bell miner associated dieback (BMAD) is a complex phenomenon in which native forest species, particularly mature eucalypts, develop an unexplained proliferation of sap-sucking insects called psyllids, which is usually also associated with alteration of forest structure and a proliferation of bell miners or bellbirds (*Manorina melanophrys*).

The resultant cycle of tree stress commonly causes the eventual death of forest stands, and serious ecosystem decline. In NSW the potential impact of BMAD-induced native vegetation dieback represents a serious threat to sclerophyll forest communities, particularly wet sclerophyll forests, from Queensland to the Victorian border. The forests most susceptible to dieback are those dominated by Dunn's white gum (*Eucalyptus dunnii*), Sydney blue gum (*E. saligna*), flooded gum (*E. grandis*) and grey ironbark (*E. siderophloia*). There is also evidence that some normally non-susceptible dry sclerophyll types may be affected when dieback is extreme. Current estimates place the potential at-risk areas at a minimum of approximately two and a half million hectares across both public and private land tenures in NSW.

BMAD is emerging as a pressing forest management issue in both the UNE and LNE regions. The potential impacts include:

- degradation of sclerophyll forest ecosystems across the UNE and LNE
- reduction in diversity and abundance of threatened flora and fauna species including Dunn's white gum and rufous bettong
- increased weed invasion and associated displacement of native forest species.

Dieback-affected areas are located in the catchments of the major rivers of the North Coast of NSW including the Tweed, Richmond, Clarence, Macleay and Hastings. Maintenance of water quality in these river systems is critically dependent on maintenance of healthy forest cover over the catchment uplands. Bell miner associated dieback has the potential to degrade these forests, and consequently impact negatively on rivers and catchment communities through increased sediment and nutrient loads, and increased frequency and intensity of flooding. Helicopter mapping has indicated that about 20,000 hectares of forest in the Toonumbar/Richmond range are affected by BMAD.

The Bell Miner Associated Dieback Working Group has developed a Bell Miner Associated Dieback Strategy to provide a coordinated approach to the management of BMAD in north eastern NSW.

During 2005–06, work took place in the Jilliby Valley in LNE that, as a result of BMAD, used airborne remote sensing techniques and led to an accurate method of mapping eucalypt tree canopy health. Work is progressing to adapt this method for use with satellite imagery to enable a cost-effective method for rating forested lands for BMAD hazard.

Eden region

In the Eden region 10% of softwood plantations were affected by insect or fungal infestation. Various soil pathogens, including *Phytophthora*, *Pythium* and *Armillaria* spp. were targeted. Surveys were conducted predominantly in softwood and hardwood plantations, with further surveys carried out in other areas as required. Results of these surveys recorded no soil pathogens within any region.

In the Eden region the increase in Sirex wood wasp was not as severe, with four hectares identified in 1999–2000 increasing to 21 hectares in 2001–02.

Boron deficiency remains a concern in young trees planted on ex-agricultural lands. However, the level of infestation has remained below 1% over the reporting period.

Southern region

In 2002–03, frost damage was reported for hardwood plantations for the first time due to a severe frost in the winter of 2002 which caused extensive damage to 4% of the hardwood estate.

DECC reserves

Eden region

DECC is continuing to monitor the fungal pathogen *P. cinnamomi* on DECC reserves in the

Eden region, although the disease status of most reserves remains unclear. Diagnosis based on symptoms in vegetation can be misleading and comprehensive assessment requires expensive soil sampling. It is thought that the pathogen is probably widespread.

At the four recorded sites the spread of *P. cinnamomi* remains either very slow or stable. Where *P. cinnamomi* is expected to occur near rare or uncommon plant communities in Mount Imlay National Park and South East Forest National Park, DECC has taken steps to monitor vegetation health and improve forest hygiene. *Phytophthora* is having an impact in *Eucalyptus sieberi* forest in the Yowaka and Mount Imlay areas. The susceptibility of some threatened plant species in the south-east is being evaluated, as are options for control using the chemical phosphite.

Preliminary trials using phosphite on *Xanthorrhoea australis* have commenced on Mount Imlay, although results remain inconclusive. A track realignment to mitigate the impact of *P. cinnamomi* at Nunnock Swamp has been completed.

Upper North East and Lower North East regions

Pathogens or fungi are not considered to be extensive in DECC reserves in the UNE and LNE regions. While vegetation in the UNE region is subject to the fungus *Phellinus noxius* which causes root rot, it is thought not to be widespread. Likewise, *P. cinnamomi* is causing substantial native plant dieback in the LNE region, although it is not a widespread problem.

Phellinus noxius

In March 2003 the Cape Byron Trust employed contractors from the Queensland Department of Primary Industries to investigate the cause of tree death within an area of littoral rainforest at The Pass, Cape Byron Headland Reserve. Tree decline was first identified within the area about 10 years earlier.

Phellinus noxius, which causes root rot, was found to be the main casual agent associated with tree death at the site. The pathogen was found to be active and has affected a number of tree species within various age classes including *Banksia integrifolia*, *Litsea australis*, *Acronychia littoralis*, *Cupaniopsis anachardioides*, *Arytera divaricata* and a species of *Ficus*.

The trees affected by *P. noxius* at The Pass occur in a rough circular patch consisting of dead and dying trees. The infection focus is indicated by the presence of trees with advanced infection and those with less advanced infections on the periphery. The fungus is still affecting the site and is continuing to spread centrifugally by up to three metres a year.

While *P. noxius* is noted for being pathogenic to a large number of plant species, the formation of an open gap due to disease activity has been noted more in monocultural systems, such as commercial plantations forests, than natural and diverse forest systems. It is possible that *P. noxius* is a relatively new introduction into the system at the pass. As a result there is either a limited amount of resistance to the pathogen within the ecosystem in this particular area, or the pathogen has evolved and is thus having a greater impact on the ecosystem.

Observation of the site is continuing to determine the presence of species that may be resistant to the fungus. If disease resistant species are identified it will allow for a rapid regeneration of the affected site. Planting a more herbaceous species that is native to the area may also be beneficial, and may allow for a fallow period (where residual woody material is allowed to decay) thus reducing fungal inoculum levels in the soil. As time passes the introduction of tree species previously growing in the infected area can proceed.

Southern region

Armillaria luteobubalina was detected during 2002–03 in a small area at Mass Cave and Bungonia lookdown. *Xanthorrhoea glauca* subsp. *glauca* exhibited gross symptoms with plants at all stages of dieback. In 2003–04 the *A. luteobubalina* site was revisited. Symptoms of dieback to *Xanthorrhoea glauca* subsp. *angustifolia* are still apparent and a similar area remains affected.

P. cinnamomi also continues to be monitored by DECC across the Southern region. It has been recorded in Monga National Park where its progress is being closely monitored. The disease status of most reserves remains unclear and diagnosis based on symptoms in vegetation can be misleading. Comprehensive assessment requires expensive soil sampling. At this stage it is

understood that the pathogen is probably widespread. However, the spread of *Phytophthora* remains either very slow or stable.

Phytophthora dreschleri is likely to occur although it is not noted for causing catastrophic symptoms. There are undoubtedly other *Phytophthora* species but considered opinion is that there not have been enough surveys of these pathogens.

P. cinnamomi was detected in a hazelnut orchard at Sassafras, adjacent to Morton National Park, in recent years. Of concern is the possibility of it spreading into nearby reserves. A watching brief of *Xanthorrhoea* spp. and *Banksia* spp. is being maintained in Morton National Park, Jerrawangla National Park and Parma Creek Nature Reserve.

Fire impacts

Indicator 3.2: Impact of fire on forest-related values (Eden region)

This is an Eden region indicator. For continuity of reporting, all regions are reported here.

Fire aids in the continuation of natural cycles of many native Australian plants and is critical to maintaining biodiversity. The historical frequency, intensity and season of fires, and the interaction between these factors, are important determinants of the impact that a single fire will have on biodiversity.

The impact of fire is monitored across public forest areas and national parks to determine the impact such events have on biodiversity values, and to provide information to develop and improve emergency and land management practices.

Fire events may be a wildfire (bushfire) or a prescribed burn. In general, prescribed burns are of lower intensity than wildfires, and occur during the cooler months of the year. The exception to this is back burning conducted to control the spread of wildfires.

Data provided for this indicator are for DECC reserves and state forests only.

The increasing severity of wildfire over the reporting period emphasises the importance of obtaining accurate monitoring data on the extent and severity of wildfires to enable the effective evaluation of the their impacts on biodiversity values and forest productivity over time.

Wildfire

1999–2000

In the UNE region, eight wildfires were reported by Forests NSW within its estate, which burnt out 509 hectares of native forest and one hectare of plantation. In the LNE region, 10 wildfires were reported by Forests NSW within its estate, burning out 52 hectares of native forest and 25 hectares of plantation.

Within DECC reserves in the UNE region, eight wildfires were recorded, affecting 7483 hectares, with 800 hectares of high intensity occurring within the North Coast Zone over the 1999 calendar year. DECC reports that within the LNE region 1092 hectares of land were affected by wildfire in 1999–2000 – predominantly of medium intensity around the Hunter region. Only two wildfires were recorded on DECC reserves in the Eden region. Each wildfire was contained to within one hectare by natural rainfall.

2000–01

The 2000–01 fire season was significantly more severe than 1999–2000. The largest extent and most serious effects of wildfire across the three regions were felt in the north-east regions.

Fires affected 198,052 hectares of DECC reserves and state forest across all regions. Of this area, 66% (131,191 hectares) of the total area burnt was within DECC reserves in the UNE and LNE regions. The remaining 34% (66,861 hectares) affected native state forest and plantations across the UNE, LNE and Eden regions. Most of the state forest burnt as result of wildfires within the UNE region where 57,108 hectares of native forest and 473 hectares of plantation were affected.

By region, the UNE region was most affected by wildfire. Within the region, 339 fire events were recorded that burnt a total area of 124,836 hectares of national park and state forest. Of the area burnt, 53% was within DECC reserves, and 46% of the area burnt within Forests NSW native forest including a small area of plantation.

The LNE region experienced 243 fire events which burnt 72,969 hectares of national park and state forest. DECC reserves were the most affected, with 87% of the total area burnt within that tenure. Some 12% of the burnt area affected Forests NSW native forest. No Forests NSW plantation areas were affected.

The Eden region was not greatly affected by wildfire during this period. Only five wildfires were recorded affecting 247 hectares. All of the area burnt was within state forest native forest. No wildfire events affected DECC reserves or Forests NSW plantation.

2001–02

During 2001–02 a particularly severe fire season was at its most intense around Christmas 2001. Some 124 bushfires were recorded on state forests across the UNE, LNE and Eden regions, affecting 62,810 hectares of both native forest and plantations.

On DECC reserves there were 184 bushfires, affecting 187,000 hectares across the UNE, LNE and Eden regions.

It is estimated that from 24 December 2001 to 16 January 2002 over 700,000 hectares of the state were burnt by bushfire (NSW Rural Fire Service 2002). Forests NSW alone spent over \$2.7 million in fighting these fires.

The north east regions experienced a prolonged and severe fire season that resulted in over 218,000 hectares of DECC reserves and state forest being burnt. More than 86% of the total area of public forest burnt in the UNE and LNE regions was in DECC reserves. Specifically, more than 118,000 hectares of public forest were burnt in the UNE region and 100,350 hectares in the LNE region.

The 2001–02 fire season in the Eden region was considerably less extensive and relatively short compared to the north-east regions. Only 1145 hectares of national park and state forest were burnt by bushfires. Over 97% of the area burnt was in state forests. Although the total area of public forest affected by bushfire was comparatively small for the Eden region, the area affected has increased by 70% over the last three years. Previously, less than 300 hectares of the Forests NSW estate were affected by bushfire. During 2001–02 this area increased to over 1000 hectares.

Of the total area of state forest burnt, it is estimated that over 17,600 hectares of native forest was burnt by greater than 70% scorch²⁷. This compares to only 5700 hectares burnt with the same intensity in 2000–01. Information on the intensity of fires occurring on DECC reserves was not available.

2002–03

As in 2001–02, the 2002–03 fire season was an above-average year for bushfires in many parts of NSW. The NSW Rural Fire Service (2003) reported about 1.46 million hectares were burnt across the state during the 2002–03 fire season. Sixty-two section 44 incidents²⁸ were declared by the NSW Rural Fire Service, involving over 11,000 personnel (NSW Rural Fire Service 2003). Fires were experienced in all coastal regions of NSW, culminating in the severe fires experienced in the south east of NSW.

Over one million hectares of DECC reserves and state forest in the UNE, LNE, Eden and Southern regions were burnt by bushfire during this period.

The Eden region has had the greatest increase in the extent of fire over the first few years of the RFAs. Much of the area burnt in the Eden region was on DECC reserves, being the result of two bushfires burning 2728 hectares. Both fires started off-park. DECC also reported 14 other fires, but these were quickly contained, burning around ten hectares in total. Four of these started on-park and ten started off-park. Of the fires that started off-park, six of them were contained by DECC crews before they entered parks. Only 35 hectares of Forests NSW native forest were affected by bushfire during the year.

The Southern region was the most extensively affected by bushfire with over 751,595 hectares of DECC reserves and state forests burnt. DECC reserves were most affected, representing about 97% (734,273 hectares) of the total area burnt. State forests were not as greatly affected, with 17,322 hectares burnt including 1,000 hectares of plantation.

Of the total area of DECC reserves burnt in the Southern region, 356,070 hectares were in Kosciuszko National Park. These fires resulted from 37 lightning strikes (356,060 hectares affected) and two suspected arson ignitions.

The Touga fire of November 2002 to January 2003 was the most significant fire on the south coast. About 64,620 hectares of DECC reserves were burnt, mostly in Morton National Park. Adverse conditions produced the most intense fire in this area since 1968. The 2002 fire caused severe scorching to native habitats and wilderness resulting in probable negative impacts to koala and insectivorous bird populations. A number of areas within the fire ground burnt at a much lower (moderate) intensity, without crown scorch. Another fire of this intensity and magnitude within another three decades could have deleterious effects on the sustainability of certain fauna species (particularly fire-vulnerable species such as koala and yellow-bellied glider) and their ability to persist at normal carrying capacities in their preferred habitats.

The UNE region was the next most extensively affected (221,000 hectares). Both DECC reserves and state forests were similarly affected with 46% (100,880 hectares) of the total area burnt being in DECC reserves, and 54% (120,192 hectares) in state forests including nearly 300 hectares of plantation.

For the LNE region the extent of bushfire across state forests and DECC reserves has decreased by about 8% since 2000–01. As for previous years, DECC reserves were again the most extensively affected (61% or 41,749 hectares of the total area). However, the extent of bushfire on DECC reserves has decreased since 2001–02.

²⁷ 70% (or greater) of the crown area experienced leaf scorch.

²⁸ Bushfire emergency declared under section 44 of the *Rural Fires Act 1997*.

2003–04

There were 57,000 hectares burnt across NSW in this year.

In contrast to the large fire events in the UNE and LNE regions in 2002–03, both regions experienced a relatively mild bushfire season during 2003–04. In the UNE the area burnt decreased to almost 21,206 hectares on DECC reserves. The area burnt within DECC reserves in the LNE region decreased to just over 14,276 hectares in this year.

In DECC reserves in the Southern and Eden regions, early intervention and favourable weather conditions enabled DECC to contain summer bushfires to small areas. In the Southern region the area burnt by bushfire was 1956 hectares. In the Eden region the area burnt by bushfire, excluding prescribed burns was 2203 hectares. The remaining burnt areas were in state forests.

2004–05

The 2004–05 bushfire season was the least severe (in terms of total area burnt across state forests and DECC reserves) since ESFM monitoring began. During the year, 21,100 hectares of DECC reserves and state forests were affected by bushfire. The total area burnt has decreased by 73% since 2003–04 and a 98% reduction on 2002–03 figures. Most of the area burnt occurred within the UNE region (11,129 hectares) and LNE region (7658 hectares).

2005–06

In 2005–06, the area of DECC reserves burnt by bushfire was 46,323 hectares. In the UNE region, in particular, the area burnt by bushfire was 27,607 hectares. Only 55 hectares were burnt in the Eden region.

The total area affected by bushfires in state forests was 5332 hectares. The region that was most affected by bushfire was the UNE region with 5,271 hectares burnt. The area affected by bushfire in the LNE region was 42 hectares and 19 hectares were burnt in Eden. There were no recorded bushfires in the Southern region during 2005–06.

Prescribed burning

1999–2000

There were 13 prescribed burns within DECC reserves covering a total area of 1665 hectares. Hazard reduction or ecological burns were carried out with approved review of environmental factors in the South East Forest National Park (total 550 hectares), Bournda Nature Reserve (less than 200 hectares), and Nadgee Nature Reserve (approximately 300 hectares).

2000–01

Prescribed burns were conducted across 37,337 hectares of DECC reserves and state forests within the UNE, LNE and Eden regions during 2000–01. Most prescribed burns were carried out in state forest (96% or 35,989 hectares of the total area burnt). This type of burning in state forests is also applied to harvested areas after logging to trigger regeneration of fire-dependent species. The remaining 4% (1343 hectares) burnt was within DECC reserves, carried out primarily for strategic asset protection or conservation purposes.

2001–02

Fuel management was undertaken across nearly 29,500 hectares of state forests through hazard reduction, post-logging and establishment burns, and more than 200,000 hectares of grazing land.

DECC undertook 22 hazard reduction burns over 1270 hectares across the UNE, LNE and Eden regions. This included seven hazard reduction burns over 654 hectares in the UNE region, 11 hazard reduction burns over 506 hectares in the LNE region, and four burns over

110 hectares in the Eden region. Burns undertaken in the Eden region were carried out either for Pambula and Womboyn town protection or because recommended fire thresholds had been exceeded and the likelihood of species loss was increased due to lack of fire.

2002–03

Prescribed burns were undertaken across about 37,670 hectares of DECC reserves and state forest in the UNE, LNE, Eden and Southern regions during 2001–02 – about 13,670 hectares in DECC reserves and the remaining 19,000 hectares in state forests. Three burns were undertaken by DECC in the UNE region on 730 hectares and 24 burns over 2800 hectares in the LNE region. In the Eden region, 10 burns were carried out by DECC over about 6800 hectares. A further 14 prescribed burns were planned over an area of 19,647 hectares, but were not undertaken due to inappropriate weather conditions and resources being allocated to bushfire events.

On DECC reserves in the Southern region, 3324 hectares were burnt during hazard reduction burns.

Post-log burns and area establishment burns were also conducted by Forests NSW as part of its fire management program. Post-log burns, undertaken to promote regeneration and reduce fire hazard that may be caused by residues (tree debris) left in an area after harvesting, were approved over an area of 89,000 hectares in the UNE, LNE, Eden and Southern regions. Post-log burns were subsequently conducted over 24,240 hectares of state forest with 2850 hectares burnt in the UNE region, 14,274 hectares in the LNE region, 5103 hectares in the Eden region, and 2015 hectares in the Southern region.

Area establishment burns were also undertaken across more than 3000 hectares of Forests NSW plantation estate during the year. In addition, 28% of state forest was leased for grazing, reducing the fuel load in these areas.

2003–04

During 2003–04, there were prescribed burns across 103,433 hectares of DECC reserves and state forests.

Of the total areas treated across both estates, 54,824 hectares were burnt by prescribed burns within DECC reserves. Much of the area subject to prescribed burns was located in parks and reserves in the LNE and Southern regions (20,438 hectares and 19,073 hectares burnt respectively). A further 246 hectares of DECC reserves was mechanically treated (e.g. slashing), mainly in the Eden region (206 hectares).

The remaining 48,599 hectares treated by prescribed burns was within state forests, mainly in the Southern region (30,582 hectares).

A further 29,810 hectares were subject to post-log burns²⁹ across the four regions.

Area establishment burns were also undertaken across more than 2220 hectares of planted forest across the four regions

2004–05

Data for 2004–05 are only available for state forests. Forests NSW conducted prescribed burns over about 47,700 hectares. A further 3800 hectares of plantation land was subject to area establishment burns. Much of the area treated by prescribed burns was in the Eden region (approximately 18,600 hectares) and Southern region (approximately 15,800 hectares).

²⁹ Post log burn – undertaken to promote regeneration and reduce fire hazard that may be caused by residues (tree debris) left in an area after harvesting.

2005–06

Hazard reduction and post-log burns then took place over approximately 26,300 hectares of the Forests NSW estate. A further 3000 hectares of plantation land was subject to area establishment burns and 2200 hectares subject to pre-harvest burns.

Much of the area treated by prescribed burns was in the Southern region (approximately 17,000 hectares).

In 2005–06, prescribed burning in DECC reserves covered about 24,500 hectares across all regions. The largest area undergoing prescribed burning was in the Southern region. Additionally, some 260 hectares of the DECC estate were mechanically treated (e.g. slashed), mainly in the UNE region.

Post fire recovery and research

Litter accumulation in Eucalypt-dominated communities in the UNE region

Fine fuels, including accumulated litter, are a major constituent of forest fires. Apart from grasses and herbs, the other critical element of fine fuel is the accumulation of litter fall and the extent of subsequent breakdown. Forest litter accumulation rates have most often been studied in tropical and other wetter forest types, often to understand nutrient recycling and pathways.

Following a fire which burnt into Ironbark Nature Reserve in September 2002, a trial was established to monitor litter accumulation and retention (i.e. breakdown). The two primary forest types affected by the fire were one dominated by Caley's ironbark (*Eucalyptus caleyi* subsp. *caleyi*) and the other dominated by tumbledown gum *E. dealbata*. This work is being undertaken over a number of years, with annual sampling of leaf fall and further refinement. This work will be extended into other reserves to gain a picture of rates of accumulation and breakdown across a range of vegetation types and a broad range of locations.

Eden burning study area

The Eden burning study area was first proposed in 1984 to provide information on the combined effects of timber harvesting and fire, and continues with ongoing data collection, analysis and reporting. The study was established to improve understanding of the impacts of fire and logging on the population dynamics of forest trees and understorey plant species. Results are expected to give better understanding of fuel build-up following hazard reduction burning, and regeneration characteristics following logging and burning. Data will underpin the development of appropriate future hazard reduction burning regimes in the dry coastal eucalypt forests of southern NSW.

Koala monitoring – Morton National Park

Koala population monitoring in the western area of Morton National Park is an ongoing DECC project conducted in conjunction with the Southern Koala Recovery Working Group. The project aims to identify the extent and nature of the low-density koala population in western Morton National Park, Bungonia State Conservation Area, Bees Nest Nature Reserve and surrounding rural landscapes.

During the 2003 spring, koalas were found to be showing breeding behaviour following the severe Touga bushfire in summer of 2002–03. A total of eleven sites were sampled by DECC, each previously known to have supported the species based on the presence of scats (faecal pellets). These sites, variously distributed in the general localities of Iron Pot, Tolwong, Tims Gully and Tullyangela, were re-surveyed in November 2003, one year after the extensive bushfire.

Six of the nine burnt sites showed koala activity within a one-year period following the bushfire. All sites extremely or severely affected by fire (total canopy scorch) showed a reduced koala activity level from that initially measured before the fire. Some very-high severity and high-

severity burnt sites showed zero activity in the first year after fire. Sites containing trees with moderate to negligible level of fire impact showed differing degrees of koala activity with no consistent pattern. The two sites located in unburnt areas showed contrasting variability in their activity levels. Call playback results and other incidental observations since the fire indicate that at least some koalas may be breeding post-fire. Koala bellows were heard and animals sighted indicating that koalas continue to exist in the Tullyangela/Tims Gully/Tolwong area and that some breeding activity was taking place.

The variability of the results shows that survey sample sizes may be too small to discern between fire impact and seasonal habitat-use patterns by koalas and that methodologies for surveying the longer-term survivorship of koalas need to be reviewed (Craven 2004).

It appears that past hazard-reduction or fuel-management burning practices in the study area have not resulted in major loss of koala biodiversity. However, episodic or frequent severe bushfire may significantly impact on the Tolwong koala population (Craven 2004).

Measuring floristic response to fire

In the Southern region, DECC has also commenced a significant monitoring program measuring the floristic response to fire in south coastal reserves. At the end of 2002–03, 29 plots had been established across a range of forest ecosystems in recently burnt and recently unburnt country. Full floristic information, mechanisms of plant regeneration and other fire-related data was collected. Data will go into the statewide fire response database of DECC's Bushfire Research Unit to contribute to the understanding of fire responses of a range of vascular plant species and ecosystems and to refine management strategies.

DECC is investigating the impact of fire on fauna, which, as an indicator of ecosystem health and vitality, is complex and determined by the interaction of many factors. These factors include type of habitat, fire intensity, extent of the fire, time since the last fire, and weather conditions after the fire.

Alps fire response monitoring

The Alps Vegetation Fire Response Monitoring System was funded by the Australian Alps Liaison Committee and completed in January 1997 (Forward and Hall 1997). Its aim was to establish long-term monitoring plots to investigate the effects of fire on vascular plant species and communities in the Australian Alps National Parks. In total, 40 sites were permanently established (21 plots in Kosciuszko National Park). A database was developed to hold the information for all the vegetation monitoring plots for Victoria, NSW and the Australian Capital Territory.

Prior to the 2002–03 fire season, the work in Kosciuszko National Park involved recording fire response for 195 vascular plant species (of approximately 1200 found in the park). The time taken for individual species to flower following fire has been recorded for 13.4% of the vascular plants in the park, and the fire response recorded for 9.6% of plants. Seedlings have also been observed and identified following fire from 16 individual species. Collectively, fire response data has been recorded for approximately 16% of the flora of the park. To date, no species (except

annuals) have been found that are not able to respond to fire through vegetative means. This data has been forwarded to CSIRO for inclusion in the National Plant Fire-Response Register.

In 2003, all plots in Kosciuszko National Park were visited and a fire assessment completed, including photographs to provide visual records of recovery. Of the 21 plots in the Nungar and Merambego sections of the park, seven sites were unburnt, one plot could not be relocated, one plot had been destroyed during fire-suppression activities and the remaining 12 sites were burnt.

5.5. Criterion 4: Soil and water resources

Key outcomes

More than 24,500 kilometres of roads and trails were located within state forests in the UNE, LNE, Eden and Southern regions.

All areas of state forests are assessed for soil erosion hazard before harvesting commences as part of the harvest planning process.

Internal and external audits check compliance against licences, codes and guidelines with respect to soil and water quality following the construction of roads and harvesting operations.

About 25,500 kilometres of roads and trails were located within DECC reserves in the UNE, LNE, Eden and Southern regions.

All DECC roads, fire trails and management trails are periodically assessed for soil erosion hazard and, where necessary, site-varying scientifically based measures to protect soil and water values are implemented.

The widespread fires of 2002–03 had an impact on roads and erosion in DECC reserves. After the fires, all affected fire trails and roads (approximately 570), and all new containment lines (approximately 200 kilometres), were systematically assessed for soil erosion hazard and measures to protect soil and water values implemented.

Soil erosion

Indicator 4.1.a: Area and percentage of forest land covered by comprehensive road management plans, which include an assessment of the extent of existing road infrastructure, processes for ongoing improvement, targets and milestones (UNE, LNE, Southern regions)

Indicator 4.1: Road density by category and catchment, and stream crossing density by catchment, for the total forest agreement area, including forest and non-forest areas. Calculation of an ecologically sustainable road index and ecologically sustainable crossing index (Eden region)

MIG Indicator 4.1.a (interim): Area and percentage of forest land systematically assessed for soil erosion hazard, and for which site-varying scientifically-based measures to protect soil erosion and water values are implemented (UNE, LNE, Eden, Southern regions)

This criterion encompasses the conservation of soil and water resources in forests. It aims to demonstrate that the risk of soil erosion has been explicitly addressed in forest management planning and field operations. The protection of soil and water is fundamental to maintaining the productivity of forests and the sustainability of ecosystem processes

State forests

All areas of state forests are assessed for soil erosion hazard before harvesting commences as part of the harvest planning process. An environment protection licence is obtained for conducting specified forestry activities for areas of state forest that come under a RFA, and subsequently, a NSW FA and integrated forestry operations approval.

Forests NSW plans and classifies its road network according to the *Forest Practices Code – Part 4 Forest Roads and Fire Trails* (SFNSW 1999b). In accordance with the code of practice, all forest road systems in public forests and plantations should be based on the principle of

minimising the combined cost of snigging³⁰ and roading, and on the principles of environmental care where soil, water catchment, cultural and landscape values are to be protected by the careful planning, location, construction and maintenance of roads and tracks and regulation of their use.

Soil erosion and water pollution hazard assessments are carried out by Forests NSW before logging is commenced. Internal and external audits check compliance against licences, codes and guidelines with respect to soil and water quality following the construction of roads and harvesting operations.

The code of practice also requires Forests NSW to prepare strategic road management plans in accordance with the national principles expressed in the document *Forest Practices related to Wood Production in Native Forests and Plantations: National Principles*.

As at 30 June 2006, Forests NSW had nine regional road management plans that cover the four NSW FA areas. The plans cover an estimated 1,293,000 hectares of state forests and are applicable to each Forests NSW softwood and native forests region³¹. Currently these road management plans are internal Forests NSW documents, but may be used in the future as a basis for the preparation of a regional ESFM supplementary plan for road management.

Of the 1,293,000 hectares, it is estimated that approximately 256,000 hectares is in the LNE region, 164,000 hectares in the Eden region, 407,000 hectares in the Southern region and 466,000 in the UNE region.

The total length of the road network within state forests across the NSW FA regions totalled approximately 30,000 kilometres. Total road length has decreased during the reporting period for all regions, except the Eden region, which increased by 2710 kilometres. The largest decrease in total road length was for the UNE region (3353 kilometres). Decreases in road length were also recorded for the LNE region (1140 kilometres) and Southern region (710 kilometres)³².

DECC reserves

As a result of expansion of the reserve system through the NSW FA process, DECC acquired a great number of roads and trails in new areas. These major infrastructure assets require continued and substantial funding to maintain them in a serviceable condition.

All DECC roads, fire trails and management trails in the Southern region are periodically assessed for soil erosion hazard and, where necessary, site-varying scientifically based measures to protect soil and water values are implemented.

About 25,500 kilometres of roads and trails were located within DECC reserves in the UNE, LNE, Eden and Southern regions. The UNE and LNE regions have almost 16,000 kilometres of roads and trails. Most (5029 kilometres) are dry weather trails. A strategic road management plan has been in place since 2001 for all roads in the UNE and LNE regions within DECC. In the Southern region a total of 7018 kilometres of roads and management trails and 103 kilometres of walking trails are maintained by DECC.

³⁰ 'Snigging' is the pulling/dragging of logs by machinery.

³¹ Forests NSW regional boundaries do not correspond with FA area boundaries. As a result a number of Forests NSW road management plans may be applicable to each FA region (for example, the UNE region is covered by road management plans for the North East Native Forest Operations Branch, Western Native Forest Operations Branch and Northern Planted Forest Operations Branch).

³² Annual variations in road length may be associated with improved assessment methods and the resultant updating of the road network data, changes in agency ownership of road networks, and/or road closure or reopening/new construction of roads.

At 30 June 2004, an estimated 38,039 hectares of DECC reserves is affected by erosion in the Southern region, with 13 hectares occurring on the coast and 38,026 hectares in alpine areas. An estimated 414 hectares of DECC reserves have been treated with partial success. On the coast a number of hectares were treated, although some stabilisation works are not complete and further work is not yet programmed. In alpine areas, 412 hectares were treated using dozer lines, while 36,911 hectares remain untreated and are at risk of topsoil loss due to their slope.

In the Eden region, a total of almost 3950 kilometres of roads and management trails are managed or co-managed by DECC. In addition, 98 kilometres of walking trails are maintained by DECC in the Eden region.

Impact of fire on erosion

As in most Australian forest ecosystems, the potential for sheet erosion by water of firegrounds following bushfires is high until groundcover re-establishes. The widespread fires of 2002–03 had an impact on roads and erosion in the parks. As a result of fire-fighting operations in Kosciuszko National Park, dozers pushed out over 120 kilometres of containment lines and about 480 kilometres of fire trails. After the fires, all affected fire trails and roads (approximately 570), and all new containment lines (approximately 200 kilometres), were systematically assessed for soil erosion hazard and measures implemented to protect soil and water values.

Works included the spreading of vegetation and topsoil back over dozer lines to encourage natural regeneration as well as the reconstruction of rollover and mitre drains. Where only a small amount of vegetation was available, especially on steeper slopes, hay bales and mulch were used. Seven culverts were installed along the Cascades Fire Trail in the park to manage creek crossings.

All works on these roads and containment lines were finalised in April 2004.

Water quality monitoring

As a condition of the environmental protection licence, made under the POEO Act, Forests NSW is required to implement a water quality monitoring program. Data generated by the program will enable measures taken to prevent sediment pollution of forest streams during harvesting to be assessed.

The objective of the water quality monitoring program is to determine if there is an identifiable impact on water quality from licensed forestry activities and if so, to quantify the level of that impact. To meet these objectives, Forests NSW conducts water quality monitoring at a number of sites according to the conditions of the agreed program. Details of the conditions are contained in the document 'Water quality monitoring for forestry activities in state forests, Phase 1, 3 February 2000' (EPA 2000). This program replaces an earlier program carried out between 1994 and 1999.

The program is conducted in a number of representative small catchments, as follows:

- Middle Brother (LNE region) paired catchment native forest program (one control catchment, one treatment catchment)
- Kangaroo River (UNE region) replicated native forest program (two control, three treatment)
- Yambulla (Eden region) replicated native forest program (two control, three treatment)
- Canobolas (outside NSW FA regions) softwoods program (one native forest control, two treatment pine catchments, one downstream site, one integrated site – this location is however outside the NSW FA regions)
- Bago (Southern region) softwoods program (one native forest control, two treatment pine catchments, one downstream site).

A total of 21 stations are monitored continuously for streamflows, rainfall and in-stream turbidity (as measured by a turbidity probe). Water samples are pumped from streams on the rising and falling limbs of flood events and at fortnightly intervals during intervening low-flow periods. The

water quality monitoring program requires monitoring at each site for a minimum of 18 months before treatment catchments are harvested, then monitoring for a minimum of 18 months following the harvest.

After harvesting in water quality monitoring catchments, Forests NSW is required to undertake two audits:

- an audit of compliance with conditions in the environment protection licence, and
- an audit of soil disturbance within harvested treatment catchments. To date, harvesting has occurred in the Middle Brother, Canobolas and Bago water quality monitoring treatment catchments.

At June 2004, Forests NSW had completed all required compliance and soil disturbance audits within the timeframes specified by DECC.

5.6. Criterion 5: Maintaining the forest global carbon pool

Key outcomes

Forests NSW estimates that 7,169,748 tonnes of carbon were sequestered from the Forests NSW softwood plantation with 3,192,008 tonnes sequestered from its hardwood plantation.

Forests NSW has attracted investment in over 4000 hectares of new plantation with a final target area of between 20,000 and 55,000 hectares at a cost to investors of up to \$720 million over the life of the plantations.

Forests NSW is involved in a range of projects that are either jointly run through the Cooperative Research Centre for Greenhouse Accounting or are funded internally. These are discussed below. It is not possible at this time to identify projects on a region-by-region basis.

Forest biomass and carbon pool

MIG Indicator 5.1.a: Total forest ecosystem biomass and carbon pool, and if appropriate, by forest type, age class, and successional stages (UNE, LNE, Eden Southern regions)

This criterion addresses the contribution to the global carbon pool of carbon from forest and forest products and contributes to Australia's obligations under the Kyoto Protocol.

Global increases in the levels of carbon emitted into the atmosphere are primarily due to the burning of fossil fuels and the clearing of vegetation. Increased levels of carbon in the atmosphere are a major factor in predicted climate changes. The retention of vegetation is important in reducing the levels of carbon in the atmosphere as vegetation acts as a 'carbon sink', absorbing atmospheric carbon. Forests are large natural pools of carbon and estimates of their biomass are a measure of their contribution to global carbon cycles.

The Kyoto Protocol requires Australia to track changes in national carbon stocks from deforestation, reforestation and afforestation activities initiated since 1990. This indicator monitors any increases or decreases in the amount of carbon stored within forest areas, forest age class and successional stage. It provides information on the changing structure of forests, eg regeneration, maturity.

For the period 1 July 1999 to 30 June 2001, the calculation of the amount of carbon sequestered is based on the following assumptions:

- mean annual merchantable increments of 16 and 13 cubic metres per hectare per annum.
- basic density of 0.42 and 0.55 tonnes/cubic metres
- carbon content of wood 0.45 tonnes of Oven Dried wood.
- one tonne of carbon is equivalent to 3.667 tonnes of CO₂.

In 2001, Forests NSW developed an improved method to calculate sequestered carbon in its plantations. The new method calculates sequestered carbon based on the following assumptions:

- CO_2 sequestered (tonnes CO_2e) = net plantation area x mean tree biomass increment (MTBI) x carbon proportion (CP) x carbon to carbon dioxide factor (CCF) where:
- $\text{MTBI} = \text{SBI} + \text{CBI} + \text{RBI}$ where:
- SBI (stem biomass increment) = $\text{TSVI} \times \text{BD}$ where:
- TSVI (total stem volume increment) – softwood = 16 cubic metres/hectare/year and hardwood = 15 cubic metres/hectare/year
- BD (basic density) – softwood = 0.42 tonnes/cubic metres and hardwood = 0.55 tonnes/cubic metres
- $\text{CBI} (\text{canopy biomass increment}) = \text{SBI} \times .1765$
- $\text{RBI} (\text{root biomass increment}) = (\text{SBI} + \text{CBI}) \times 0.2$
- CP (carbon proportion) = 0.5
- CCF (carbon to carbon dioxide factor) = 3.667

The use of two different methods means that rates of sequestration cannot be directly compared across years.

Carbon sequestered in Forests NSW hardwood and softwood plantations is calculated for the net stocked area only. All environmental exclusions and retained native vegetation are excluded from the calculations, providing a more accurate estimation of the amount of sequestered carbon.

The amount of carbon sequestered is dependant on the area of plantation. This area changes each year because of harvesting and new plantings.

State forests

1999–2000

Forests NSW estimates that for net softwood plantations owned by Forests NSW, 623,000 tonnes of carbon were sequestered in 56,180 hectares of plantation within the UNE region, LNE and Eden regions. For net hardwood plantations owned by Forests NSW. It is estimated that 248,500 tonnes of carbon were sequestered in 42,810 hectares of plantation within the UNE, LNE, and Eden regions.

2000–01

Forests NSW estimates that for net softwood plantations owned by Forests NSW in the UNE, LNE and Eden regions, 620,974 tonnes of carbon were sequestered in 55,999 hectares of plantation. Estimates for the net hardwood plantations owned by Forests NSW are 578,178 tonnes of carbon sequestered in 49,004 hectares of plantation in these regions.

2001–02

An estimated 1,228,860 tonnes of carbon were sequestered from a net softwood plantation area of 70,645 hectares across all regions. An estimated 449,770 tonnes of carbon were sequestered from a net hardwood plantation area of 21,061 hectares across all regions.

2002–03

An estimated 2,551,475 tonnes of carbon were sequestered in a net Forests NSW softwood plantation area of 146,679 hectares in the UNE, LNE, Eden and Southern regions. An estimated 1,306,951 tonnes of carbon were sequestered in a net Forests NSW hardwood plantation area of 61,200 hectares in these regions.

2003–04

For softwood plantations, about 2,989,817 tonnes of carbon were sequestered in a net stocked area of 171,879 hectares in the UNE, LNE, Eden and Southern regions. An estimated 284,962 tonnes of carbon were sequestered in a net hardwood plantation area of 13,343 hectares in these regions:

2004–05

In 2004–05, Forests NSW estimated that there were around three million tonnes of carbon sequestered in its planted Forests NSW forest estate. The Southern region is the largest contributor to this total of around two million tonnes sequestered in the softwood estate. The plantation estate in the UNE and LNE regions are currently estimated to have sequestered over 400,000 and 200,000 tonnes of carbon respectively. There is also an estimated 500,000 tonnes of carbon sequestered in softwood plantations in the Eden region.

2005–06

In 2005–06, Forests NSW estimated that there were 3,125,994 tonnes of carbon sequestered in its planted forest. The Southern region is the largest contributor to this total with an estimated 2,028,803 tonnes of carbon sequestered. It is estimated that the plantation estate in the UNE, LNE and Eden regions had 345,902 tonnes, 237,285 tonnes, 514,004 tonnes respectively of carbon sequestered.

DECC reserves

DECC has undertaken no activities that have reduced carbon from its forested estate within the UNE/LNE, Eden or Southern regions. However, over 9400 hectares of cleared land within DECC reserves was identified as suitable for reforestation.

Contribution to global carbon budget

MIG Indicator 5.1.c: Contribution of forest products to the global carbon budget (UNE, LNE, Eden, Southern regions)

This criterion addresses the contribution to the global carbon pool of carbon from forest and forest products and contributes to Australia's obligations under the Kyoto Protocol.

Forests can maintain their contribution to global carbon cycles by maintaining or increasing the amount of carbon stored in them. The rate at which carbon is removed, even though temporarily, from the system, can be assessed by accounting for the different end products from forest industries. By increasing the proportion of wood converted to long-lived products, such as building materials and furniture, the quantity of carbon held in storage will be increased.

Carbon trading

In early 2005, the NSW Greenhouse Abatement Scheme accredited Forests NSW to become the first body in the world to trade carbon credits arising from forests in a registered greenhouse gas abatement scheme. Forests NSW registered 166,005 certificates – each equivalent to one tonne of carbon dioxide. The certificates represented the carbon sequestered during 2004 from 10,000 hectares of planted hardwood forests. The first batch of Forests NSW carbon certificates, worth more than \$1 million, were bought by Energy Australia to help offset the greenhouse gases released into the atmosphere as a result of electricity use in NSW. The initial success of the NSW scheme confirms there is a market for tradeable carbon certificates and provides incentives for companies to invest in new plantations.

The ability to trade carbon credits in NSW may contribute to areas of plantation being established and managed over longer rotations for high-quality sawlogs or established purely for environmental reasons with income from credits offsetting establishment costs. Either way, it is an improvement for the environment, for industry and for the community.

The expansion of Forests NSW plantation estate, which takes place largely on land previously managed for agriculture, is also creating long-term change in land use and a new store of carbon. It not only maintains equilibrium, but also takes extra carbon out of the atmosphere, thereby providing a positive contribution to the environment. This extra carbon can be used to create certificates under the NSW Greenhouse Gas Abatement Scheme.

In addition to developing a carbon accounting system that is sufficiently robust to gain accreditation under the NSW Greenhouse Abatement Scheme, Forests NSW has been heavily involved in developing state, national and international standards and guidelines to enable carbon accounting and trading.

5.7. Criterion 6: Socio-economic benefits

Forests have a wide range of environmental, social, cultural, economic and aesthetic values. Throughout history forests have been used to produce timber and other products, protect water catchments and provide habitat for wildlife. They also provide places for recreation and tourism, employment and cultural identity.

This criterion provides information to help determine the value of forests to society. This includes economic value, such as the importance of forest areas as a basis for tourism/recreation and employment, and how these areas contribute to the wider regional economy. Furthermore, the criterion also measures the less tangible social and cultural values of forests, particularly indigenous heritage.

Additionally, this criterion also addresses the need to preserve culturally significant places and sites.

Key outcomes

Visitation to DECC reserves remains high. Over 3.7 million visits were recorded to various parks and reserves in the southern and Eden regions during 2003–04. In this same period a total of 1.3 million visits were made to parks in the UNE region and 534,721 visits made to parks in the LNE region.

Reliable estimates of visitor use of state forests are more difficult to provide as approximately 96% of the estate is open for forest-related recreational activities. Nevertheless visitation remains high.

The number of facilities available across the UNE, LNE and Eden regions has fallen by about 46% since 1999–2000. This fall in the number of recreational facilities largely occurred in the north east regions between 1999–2000 and 2000–01 (decreasing by about 49%). The total of 46 facilities available in state forests in the Southern region has remained stable since monitoring began in 2002–03.

Overall, there has been a decreasing trend in the number of recreational and educational activity permits issued since ESFM monitoring began in 1999–2000. Data indicates a 31% fall in permits issued since 1999–2000, and includes those issued for the Southern region in 2003–04.

Total employment by DECC (direct) and Forests NSW (direct and indirect) has remained relatively stable since 2000–01. At the end of 2005–06, combined employment by Forests NSW and the Parks and Wildlife Group of DECC was estimated to be 7615 equivalent full-time (EFT) employees in the forest agreement regions (694 employees in Forests NSW and 6921 employees in DECC).

In 2005–06, the total number of Aboriginal objects recorded on-park totalled 4529, with a further 15,153 Aboriginal objects recorded off-park across all regions. There were 4729 hectares of state forest with predominantly Aboriginal management.

A total of 4787 historic sites were recorded on the DECC and Forests NSW forest estates.

Visitation

MIG Indicator 6.2.c: Number of visits per annum (UNE, LNE, Eden, Southern regions)

This indicator gives information on the estimated number of visits to the region's national parks and state forests. Reporting against this indicator is largely based on estimates.

1999–2000

Based on DECC counter figures for visits to national park areas in the Eden region, 163,100 visitors were recorded. Most visitors were to Ben Boyd National Park and Bournda National Park, with the peak month for visitation in January. No data on the number of visits to DECC reserves in the north-east regions (UNE/LNE regions) was provided for 1999–2000 – therefore no comparison can be made.

2000–01

The estimated number of visitors to public forests across the UNE, LNE and Eden regions was 7,981,653. Of these, 90% were visitors to national parks.

Of the remaining 10% visitors to state forests, it is estimated that 16,000 individuals visited the Eden region forests, while 850,000 visited the forests of the UNE and LNE regions.

DECC estimates during 2000–01 that 2,698,639 visits were made to DECC reserves in the UNE region and 3,727,679 visits in the LNE region.

It is estimated that 689,335 visits were made to a national park or nature reserve in the Eden region.

In addition to these estimates, Forests NSW periodically measures visits to a limited number of key sites in the UNE, LNE and Eden regions. In 2000–01 data was only collected from one site, the Sealy Lookout in the UNE region. Data for this site was collected over a 26-day period (March 2001 to April 2001) with the following results:

- 1750 vehicles entered the forest over the survey period
- an average of 63 vehicles per day entered the forest
- about 158 visitors each day and so approximately 57,670 people visited the forest this year (assuming an average of 2.5 people per vehicle)³³.

Reliable estimates of visitor use of state forests are difficult as approximately 96% of the estate is open for forest-related recreational activities. State forests are available to the public for many forms of recreation and sporting events such as camping, bike-riding, horse-riding, bush walking, dog walking and picnics that do not require a permit or designated area. The extensive network of roads maintained and available for public use makes ongoing monitoring not feasible on state forests.

2001–02

In the Eden region, about 731,000 visits were made to a national park or nature reserve during 2001–02. Visitor days to forest areas were estimated to be in excess of 175,000. Adjusted visitation figures for specific sites in the Eden region appear to indicate increased annual visitation to Nadgee Nature Reserve at Disaster Bay via Womboyn (19% increase), and to Aragunnu (23% increase) and Nelson Lagoon (43% increase) in Mimosa Rocks National Park.

33 These figures are likely to be a major underestimation of the actual number of individuals that visited the forest as buses are only counted as one vehicle. Unofficial estimates indicate approximately 120 000 visitors for the year to this particular site.

Piper's Lookout, South East Forest National Park (70,000 vehicles) and Ben Boyd National Park (more than 89,900 vehicles) remained popular destinations, and Bournda National Park (more than 99,500 vehicles) remains the most popular coastal destination.

Visitor numbers to DECC reserves in the north-east regions for 2001–02 were only available for selected park and/or reserve areas. Results for the UNE region indicate that Mount Warning was receiving around 52,000 visits per year. Over three months of data collection, around 13,000 people visited Mount Warning National Park. Of the 13,000 visitors, more than 86% (11,240) walked on the summit track, and more than 91% (11,906) took the easier walk along the Lyrebird Loop (note that these counts are not mutually exclusive).

In state forests visitation is periodically measured at a limited number of sites in the UNE, LNE and Eden regions. Data for the 2001 calendar were available for the Dungog and Watagan forests in the LNE region only. In the Watagan state Forest, the number of visitors was estimated at 108,000. Of the total number of recorded visitors to the forest, 14% were day-users and 86% overnight campers. Conversely in Dungog forests, of the estimated 122,000 visitors recorded, 72% were day visitors and 28% overnight campers.

2002–03

DECC estimates more than 2.48 million visits were recorded in national parks in the north-east regions. Of the estimated total visits, almost 1.65 million were to national parks in the UNE region, and more than 834,000 visits to national parks in the LNE region.

The 19 forested parks in the UNE region, for which data are available, recorded almost 1.65 million visits over 2002–03. For Mount Warning National Park, the 2002–03 visitation estimate of 79,310 was considerably higher than the 2001–02 estimate (52,000).

An estimated 2,330,655 visits were made to a national park or nature reserve in the Southern region during 2002–03. The 2002–03 visitation records for Kosciuszko National Park were, however, significantly affected by the fires as much of the reserve was closed for the first three months of 2003.

No data on visits made to state forests were available for 2002–03.

2003–04

Due to technical difficulties encountered with the data counters and software, there is no data for the 30 locations in DECC reserves in the UNE and LNE over the full reporting period. The estimated number of visits has, therefore, been based on the percentage of the year that data were collected. During 2003–04, a total of 1,370,948 visits were made to parks in the UNE region, equating to 1,257,124 visitor days throughout the year. For the LNE region, records indicate that there were 534,721 visits to parks in the region, and the same number of visitor days to forests during this period.

For the Eden and Southern region, over 3.7 million visits were recorded to various parks and reserves during 2003–04. Specifically, 3,534,734 visits were recorded in more than 50 parks in the Southern region, with a further 174,421 visits recorded in eight parks in the Eden region. In more than 50 parks in the Southern region, the number of visits increased by more than a million in the previous year to 3,534,734. This is likely to reflect an increase in the reporting capacity for visitor numbers in the Southern region, rather than an increase in the total number of visits.

No data on visits made to state forests were available in 2003–04.

2004–05

There were an estimated 16.5 million visits to parks and reserves across all regions in 2004–05. The Eden region, with the smallest area and the fewest number of parks had the least visitors. The Southern region, which includes the highest number of visitors to an individual park (Kosciuszko National Park) received the highest visitor numbers overall.

No data on visits made to state forests were available in 2004–05.

2005–06

No data on visits made to state forests or DECC reserves were available in 2004–05. Parks data is now provided on a two-yearly basis through the State of the Parks reports.

Use of recreation facilities

Indicator 6.3: Availability and usage of recreation/tourism facilities (Eden region)

– Data has been provided for all regions.

This indicator provides information on access to public forests for recreational and tourism purposes. It also provides a coarse measure of the extent to which forest management is providing for the recreational needs of the community.

Recreation facilities across both state forest and national parks provided a range of recreation opportunities including bush walks, camping, picnicking, swimming, four wheel driving, horse riding and fishing.

An assessment has been made by the Parks and Wildlife Group of DECC about the adequacy and appropriateness of recreation facilities across the four forest agreement regions in NSW.

There were 114 reserves with facilities appropriate to the type of reserve and current levels of usage. A further 67 reserves had facilities appropriate to the type of reserve but insufficient to meet the demands of current use. There were 295 reserves in each region with no visitor facilities but where this has been assessed as appropriate. There are 10 reserves currently with no facilities but which required additional facilities. Seven reserves had inappropriate facilities for the type of reserve. Further details are presented in table 5.22 below.

Table 5.22: Numbers and assessment of the adequacy of visitor facilities within DECC reserves

Assessment criteria	UNE	LNE	Eden	Southern	Total
	n=153	n=194	n=19	n=127	n=493
Visitor facilities and services are appropriate to the reserve category and adequate for current levels and types of visitation	39	48	5	22	114
Visitor facilities and services are appropriate to the reserve category but are inappropriate for current levels and types of visitation	17	31	5	14	67
There are no visitor facilities or services despite an identified need	2	2	0	6	10
Existing facilities are inappropriate for the reserve category	1	2	0	4	7
There are no visitor facilities on this reserve and the nature and level of visitor use and reserve category do not justify their provision	94	111	9	81	295

n = numbers of reserves

The total number of recreation and tourism facilities in state forests in 2005–06 totalled 143. The majority of these recreational and tourism facilities were within the LNE (64) and Southern (53) regions. Overall there was a 5% decrease in the number of facilities across all NSW FA regions. This is mainly due to an 18% reduction of facilities within LNE region, in particular a decrease in the amount of marked forest walks and camping areas. In the Southern region, the number of facilities has increased by 15% due to an increase in the number of roadside rest and picnic areas, marked forest walks and camping areas. The number of recreation and tourism facilities in the UNE and Eden regions remained unchanged in 2005–06.

In addition, across the NSW FA regions, 3053 hectares of state forest have a designated 'special value' of tourism and recreation under the forest management zoning system. This value is applied to sites that have established recreation facilities or sites that are planned and suitable for development.

The decline in the number of permits issued by Forests NSW in the NSW FA regions occurred largely between 2000–01 and 2001–02, particularly in the Eden region. This marked decline in the number of permits issued has been considered, for the most part, a reaction to changes to public liability insurance and increasing premiums, particularly as many of the types of recreation undertaken on state forest are adventure and 'high risk' activities. Since 2001–02, the number of permits issued, although notably less than those issued before 2001–02, have remained relatively stable.

**Socio-economic benefits of parks to communities in Yuraygir National Park:
a case study in the UNE region**

Information on visitor type and expenditure patterns in NSW provides valuable input into the development of strategies for promoting park-related tourism and regional socio-economic development. DECC has conducted a number of studies into the importance of parks to regional communities to better understand this relationship.

A study has been undertaken in Yuraygir National Park, which protects the longest stretch of undeveloped coastline in NSW from Red Rock north to Yamba in northern NSW. The park, created in 1980, covers 30,406 hectares. In 2000, it had an estimated 450 000 visitors.

Data were gathered from 486 on-site interviews and 333 mail-back questionnaires that were administered on four separate occasions between October 1999 and July 2000. This survey data (adjusted to reflect the likelihood that a park visit is not necessarily the only reason for a trip) revealed that visitors from the North Coast region spent on average \$51 per trip, while visitors from outside the region spent on average \$31 per trip. In total, all visitors to the park averaged an expenditure of \$36 per trip.

Visitors to the park from the North Coast region spent a total of \$5.5 million (including \$1.1 million on accommodation, \$3.2 million on shopping and \$0.9 million on petrol). In contrast, visitors to Yuraygir from outside the region spent a total of \$10.5 million (including \$1.8 million on accommodation, \$5 million on shopping, \$2.5 million on petrol, and \$0.6 million on meals). The total on-park expenditure for management of Yuraygir National Park in 2000 was \$1.5 million.

DECC management expenditure at Yuraygir National Park is estimated to have generated \$1 million in regional household income, and created 14 jobs in addition to the 10 people directly employed in management of the park. The \$10.5 million expenditure by visitors to Yuraygir from outside the region is estimated to have generated \$5.7 million in regional household income, and created 187 jobs.

Employment benefits

MIG Indicator 6.5.a: Direct and indirect employment in the forest sector and forest sector employment as a proportion/percentage of total employment (UNE, LNE, Eden, Southern regions)

Indicator 6.4: Employment numbers by type across all forest users in the Eden region

This sub-criterion monitors employment across the forest sector, including forest growing and management, tourism, and forest-product processing.

This criterion provides information to help to determine the value of forests to society. This includes economic value, such as the importance of forest areas as a basis for tourism and recreation and employment, and how these areas contribute to the wider regional economy.

Employment in the forest management and conservation sector is important to many regional economies. Data within this indicator have been provided by Forests NSW (direct and indirect employment) and DECC (direct employees only).

Total employment by DECC (direct) and Forests NSW (direct and indirect) has remained relatively stable since 2000–01³⁴.

The direct and indirect employment figures provided by Forests NSW cover a range of activities, including growing and managing of forests, harvesting and haulage, primary processing, apiary, grazing and activities such as gravel extraction and plantation establishment contracting.

Estimated figures provided by Forests NSW for the total direct and indirect employment in the forest sector across all regions totalled 6676 equivalent full-time (EFT) positions for 2005–06. The largest employment sector is primary processing, which makes up 67% of its total employment across all NSW FA regions. Harvesting and haulage accounts for 16% and growing and managing of forests accounts for 8% of employment.

At the end of 2005–06, combined employment by Forests NSW and DECC was estimated to be 7615 EFT employees.

In 2005–06, there were 304, 198, 281 and 56 staff employed within the LNE, UNE, Southern and Eden regions respectively.

Indicator 6.5: Gross income index related to forests (Eden region)

No data was provided for this indicator over the reporting period.

³⁴ Data for 1999–2000 has not been included as an accounting error was made in employment figures for Forests NSW and only incomplete data were available for employment by DECC.

Cultural heritage benefits

Indicator 6.4.c: Change in condition and number of recorded places, artefacts, sites, buildings or other structures (UNE, LNE regions)

Indicator 6.6: Change in condition and number of recorded places, artefacts, sites, buildings or other structures (Eden region)

Indicator 6.4.c(i): Change in condition and number of Aboriginal cultural heritage features within the forest estate including recorded places, artefacts, sites, or other structures (Southern region)

Indicator 6.4.c(ii): Change in condition and number of historic heritage features within the forest estate including recorded places, artefacts, sites, buildings or other structures (Southern region)

Monitoring the number of heritage sites located within forests assists in measuring the appropriateness of management practices to ensure the social and cultural values of forests are maintained and/or enhanced. However, the social, cultural and aesthetic values people have are often intangible and therefore difficult to measure. Quantitative data, such as the number of sites, can only provide an indicative measure.

The increase in the number of Aboriginal sites recorded is the result of survey and research activity (including pre-operational investigations by Forests NSW), and increased community participation in providing information to the Aboriginal Heritage Information Management System (AHIMS).

Aboriginal cultural heritage

By 2005–06, the total number of Aboriginal objects recorded on-park totalled 4529, with a further 15,153 Aboriginal objects recorded off-park across all regions.

There were also 4729 hectares of state forest with predominantly Aboriginal management. The Eden region had the most land in this category (3987 hectares). In the LNE region two co-management agreements existed, covering an area of 50,000 hectares.

Changes in the condition of recorded Aboriginal cultural heritage features

The condition of numerous recorded Aboriginal cultural heritage features has changed. The majority of this change can be attributed to either the 2002–03 fires or associated fire suppression activities. Fire damage to recorded sites and places has been systematically evaluated. It was determined that the 2002–03 fires resulted in minimal impacts to identified features. However, the impact of fire suppression activities on Aboriginal sites and artefacts was, in some instances, more significant.

The impact of fire suppression activities on Aboriginal sites and artefacts has been partly evaluated during pre-rehabilitation works inspections. While a few artefacts were damaged by fire suppression activities, most artefacts were moved or covered over in creating containment lines. The creation of containment lines also revealed a large number of previously unrecorded artefacts and sites.

Historic non-indigenous cultural heritage

In 2005–06, a total of 5075 historic items and places were recorded within DECC reserves across all regions.

Forests NSW regions maintain a section 170 Heritage and Conservation Register using the state Heritage Inventory database developed by the NSW Heritage Office that identifies sites and objects of heritage significance for internal reference. Site details are also submitted to the NSW Heritage Office for inclusion on the State Heritage Register when required. All sites of non-indigenous exploration and settlement that are assessed and recognised to be of local or regional historical significance are also incorporated within the Forests NSW GIS system. Potential buffers around significant sites are incorporated into the FMZ system.

5.8. Criterion 7: Legal, institutional and economic frameworks

This criterion and associated indicators relate to the overall policy framework that assists in the conservation and sustainable management of forests.

It includes the broader societal conditions and processes often external to the forest itself but which may support efforts to conserve, maintain or enhance one or more of the conditions, attributes, functions and benefits captured in criteria 1–6.

Key outcomes

There are five Acts that provide for the management of natural and cultural values of forested areas in NSW. These acts are the FNPE Act, Forestry Act, NPW Act, TSC Act and the *Aboriginal Land Rights Act 1983*.

The broad framework for the management of public forests in NSW is provided by three documents:

- NSW/Australian Government RFA
- NSW FA, and
- Integrated Forestry Operations Approval.

The NSW FA sets out a cooperative, strategic framework for the management of public forests, with the primary goal of promoting the achievement of ESFM. This includes providing for a sustainable timber supply. Community consultation is mandatory. Four FAs relate to the UNE, LNE, Eden and Southern regions.

A range of educational and staff training programs focusing on ecologically sustainable forest management are continuing.

The State of the Parks program, ESFM monitoring and *State of the Forests* provide regular reports on monitoring at the regional and state level.

Forests NSW research and development objectives are delivered primarily through its Research and Development Division. DECC is continuing its research efforts into forest ecology.

Legal framework

MIG Indicator 7.1 (narrative): Extent to which the legal framework (laws, regulations, guidelines) supports the conservation and sustainable management of forests (UNE, LNE, Eden, Southern regions)

Indicator 7.1.a Provides mechanisms to clarify property rights and establish appropriate land tenure arrangements that recognise traditional management practices and self management as well as the existence of native title and the customary and traditional rights of indigenous people

This is a very broad criterion, aiming to facilitate ESFM by ensuring plans, policies and existing legal and economic frameworks are not impediments. It recognises both indigenous and non-indigenous people in decision-making and planning processes. It notes the need for the promotion of public awareness and education. It facilitates mechanisms for ongoing research into forest management to enhance and improve practices.

The information provided for criterion 7 is at the statewide scale and, in most cases, is not directly attributable to individual regions.

To successfully achieve the goal of ESFM, legislative, institutional and economic frameworks must be in place. These frameworks provide a legal means by which decision making and planning processes can help improve the extent to which ESFM is brought about.

Important components of these frameworks include laws, regulations, guidelines, codes of practice, policy development and review, research, and public awareness and education programs.

Forestry and National Park Estate Act 1998

The FNPE Act has important implications for the land managed by Forests NSW and DECC and introduced a new management regime for both organisations. The Act specifically:

- transfers certain state forests and other Crown lands in the UNE, LNE and Eden regions to DECC reserves or Aboriginal ownership
- provides for NSW FAs on public land. The NSW FAs contain provisions that promote ESFM, sustainable timber supply from forestry operations, community consultation on forestry operations, native title rights and interests or Aboriginal land claims and other provisions.
- provides for the granting of IFOAs. These contain conditions for carrying out forestry operations and may contain the terms of a licence under the POEO Act, a licence under the TSC Act, or a licence under part 7A of the FM Act.

Forestry Act 1916

The Forestry Act provides for the conservation and sustainable management of forests on the state forests estate and of other forests managed by Forests NSW. The Forestry Act supplies a framework for the management of a suite of different forest values including conservation, biodiversity and soil and water.

The Forestry Act sets a benchmark for conservation by setting areas aside for timber production and flora reserves that may have otherwise been cleared or detrimentally altered. The Act also regulates the extraction and replenishment of forest resources from areas it manages ensuring the sustainable use of forests.

National Parks and Wildlife Act 1974, Threatened Species Conservation Act 1995 and Wilderness Act 1987

The NPW Act, the TSC Act and the *Wilderness Act 1987* all primarily provide for the conservation and sustainable management of ecosystems and biodiversity. Forest ecosystems are an example of one of the many types of ecosystem protected and managed under these pieces of legislation.

Conservation occurs directly through the reservation of land and/or its declaration as wilderness and through the licensing of activities that might harm native flora and fauna. Plans of management are created for reserved lands to ensure that the conservation values of those lands are protected.

The Acts provide for a number of off-reserve and indirect mechanisms for ensuring conservation and sustainable management of forests outside the reserve system, including conservation agreements with land holders and the declaration of threatening processes for threatened species.

The Acts managed by DECC contain numerous public processes. For example, management planning under the NPW Act requires public exhibition of a draft plan and a call for submissions. A similar process is in place in relation to wilderness assessment in accordance with the Wilderness Act.

Plantations and Reafforestation Act 1999

The P&R Act and Plantations and Reafforestation (Code) Regulation 2001 (P&R Code) commenced in December 2001, replacing the TPHG Act. The Act provides a level of certainty to growers by supporting the establishment of plantations on essentially cleared land, at the same

time ensuring a level of environmental protection (DIPNR 2004a) and reflecting the strategic direction of policies such as *Plantations for Australia: The 2020 Vision* (DIPNR 2004b).

Both private and public growers may seek authorisation under the Act through a consent process administered by DPI. Authorised plantations must then operate in accordance with the code and subject to periodic audits by DPI. The code under which plantation operations must comply includes specific conditions for:

- planning and approval process (including a requirement for a pre-application site inspection)
- establishment, management and harvesting operations
- standards for the protection of soil and water, cultural heritage and biodiversity
- standards for the construction and maintenance of log dumps, roads and crossings, and
- management of retained areas (DIPNR 2004a).

Native Vegetation Act 2003 and Native Vegetation Regulation 2005

The NV Act and NV Regulation commenced in December 2005. The Act and regulation replace the NVC Act.

The NV Act establishes the legal basis for ending broadscale clearing unless the clearing improves or maintains environmental outcomes. The NV Act also encourages revegetation and rehabilitation of land with native vegetation by providing landholders with incentives for good land management (DNR 2006).

The Native Vegetation Regulation provides the framework for how the Act will work operationally. The regulation was developed after extensive consultation with a number of stakeholders. Provisions within the regulation include:

- the form and content of property vegetation plans (PVPs) and how they will be recorded
- information about PVPs and development consents
- clearing without approval (including regrowth and routine agricultural management activities)
- the methodology for assessing whether a clearing proposal passes the 'improve or maintain' test required by the Act, and
- catchment management authority (CMA) discretionary powers (DNR 2006).

Management policies, guidelines and codes of practice

The broad framework for the management of public forests in NSW is provided by three documents:

- NSW/Australian Government RFA
- NSW FA, and
- Integrated Forestry Operations Approval.

Regional forest agreements

The RFAs are a joint NSW and Australian Government agreement on the management of forested areas. Like the NSW FAs, the region to which the RFA is to apply must firstly undergo a CRA (including regional forest assessment), where various social, environmental, economic and heritage values are addressed.

The agreements set out broad strategies for an ecologically sustainable and competitive forest industry. They contain numerous provisions, similar to those in the NSW FAs, which aim to promote the sustainable management of forested areas.

Once an agreement is made it is in place for a period of 20 years, and may be revoked at any time by either party. Like the NSW FAs and IFOAs, the agreement is reviewed every five years.

Forest agreements and integrated forestry operations approvals

The FNPE Act provides for the making of NSW FAs and IFOAs. These documents set out a strategic and operational framework for the management of public forest areas. Both are granted jointly by the Ministers administering the Forestry Act, *Environmental Planning and Assessment Act 1979* (EP&A Act), NPW Act, POEO Act and the FM Act.

Before a NSW FA is made, the region to which the agreement is to apply must undergo a regional forest assessment (including CRA). These assessments must consider environment and heritage values, Aboriginal heritage, economic and social values, and ESFM and timber resource values.

The NSW FAs set out a cooperative, strategic framework for the management of public forests, with the primary goal of promoting the achievement of ESFM. This includes providing for a sustainable timber supply. Community consultation is mandatory. Four FAs relate to the UNE, LNE, Eden and Southern regions.

Following the making of a NSW FA, an IFOA may be made. The IFOA sets out the terms and conditions under which logging can be carried out within state forests. The approval may contain licences under the TSC Act, POEO Act, and the FM Act.

These licences provide for the protection of threatened species and habitat, soil and water quality and fish habitat. Four IFOAs have been implemented in the UNE, LNE, Eden and Southern regions, each containing a licence under these Acts.

Both the NSW FAs and IFOAs are in place for a period of 20 years, with a comprehensive review of its implementation and effectiveness every five years. The review period allows the parties to assess the suitability of provisions contained in the agreements and approvals to achieve ESFM. Breaches of conditions contained in the IFOA (including licences) may incur penalties and court proceedings.

The agreement and approval may be revoked at any time at the discretion of the Ministers administering the relevant Acts under which they were formed. However, should the NSW FA be revoked, the IFOA must also be revoked, as an IFOA only applies to lands covered by a NSW FA.

DECC policies

A list of DECC policy documents is published each June and December in the NSW Government Gazette and on the DECC website (<http://www.nationalparks.nsw.gov.au>) under DECC Summary of Affairs. These documents include corporate documents, scientific policies and manuals, personnel guidelines, and field policies and procedures. They are available for inspection by arrangement or purchase.

Forests NSW policies

Forests NSW corporate policies provide a consistent approach to the development of clear and concise policies. This ensures staff members have easy access to current policies and establishes a regular review process. Financial, CEO and administration circulars are under constant review and may vary as government policy or circumstances dictate. Some of these include:

- Managing Our Forests Sustainably: Forest Management Zoning in NSW State Forests (Forests NSW 1999a);
- ESFM strategic plans for each region.

Forests NSW codes of practice

Forests NSW has developed forest practice codes to identify non-site-specific terms and conditions for forestry activities that have the potential to impact on environmental values. These include codes for:

- timber harvesting in Forests NSW plantations
- timber harvesting in native forests
- plantation establishment and maintenance
- forest roads and fire trails.

The legal framework and Aboriginal people

There are three principal Acts in NSW which provide recognition of Aboriginal ownership and other land tenure arrangements – *Native Title Act 1994* (NT Act), part 4A of the NPW Act, and the *Aboriginal Land Rights Act 1983* (ABLR Act).

The ABLR Act and the NPW Act contain provisions that recognise customary and traditional rights of indigenous people to land. The ABLR Act contains mechanisms for land claims to be made by local Aboriginal land councils and for ownership of that land to be vested in the council if the claim is granted.

Part 4A of the NPW Act allows for specified reserves to be transferred into the ownership of Aboriginal people and then leased back to the NSW Government and managed jointly.

The NT Act identifies ways to undertake acts validly, by following the provisions in the Act. Forests NSW has adopted procedures to ensure that native title representative bodies and native title claimants are notified in those situations directed by the Act. Section 104A of the Act protects existing native title rights in relation to activities associated with reserving land for protected areas and managing that land.

Forests NSW involvement in the resolution of native title claims is within its framework of a whole-of-government approach, directed by the Department of Premier and Cabinet. The procedure for resolving claims can involve the National Native Title Tribunal and the Federal Court, through initial mediation and court hearings.

Land use agreements

The NT Act provides for the making of Indigenous Land Use Agreements to deal with the conduct of 'future acts' and compensation. Where claims exist over state forest, native title matters will be dealt with in accordance with the direction of the Department of Premier and Cabinet. Consideration might be given where the NSW Government accepts the applicant's evidence as being 'credible evidence'.

In 2001–02, the first indigenous land use agreement in NSW was registered with the Native Title Tribunal for the Arakwal people. The Arakwal National Park in the UNE region is now jointly managed by DECC and the Arakwal people.

The Arakwal National Park Management Committee has been established with representatives from DECC, the Arakwal community and the Byron Shire Council. During the year, the committee initiated a broad range of management activities, including:

- a current study to identify the Aboriginal heritage values of the park, including 'back to country' days for the Arakwal and other Bundjalung people to meet and discuss past, present and future values associated with the park
- a current ethno-botanical study to identify, map and make management recommendations relating to plants that are culturally important to the Arakwal people
- developing a business plan, funding applications and architectural drawings for a cultural centre to be built on Arakwal land in Byron Bay

- the second Spirit of Bundjalung Art Award in which Aboriginal artists exhibit their work on a cultural place or story relating to the Bundjalung nation.

Lease-back arrangements have been developed for Biamanga and Gulaga national parks on the far south coast of NSW.

The Ourimbah Protocol is a unique partnership between Forests NSW and central coast community groups and businesses including Darkinjung Local Aboriginal Land Council, the Combined Community Organisation (Gosford), Central Coast Landcare Network and the Sydney Rainforest. The partnership provides opportunities for the wider community to become involved in forest management to improve the social, cultural, environmental and economic benefits derived from 65,000 hectares of state forests along the central coast.

Repatriation to Aboriginal communities

The repatriation program was developed to facilitate the return of Aboriginal ancestral remains, cultural material and information under the provisions of the NPW Act to Aboriginal communities across NSW.

In 2003–04, the program facilitated the return of ancestral remains and cultural material to Aboriginal communities in five different areas of NSW including two within the LNE region – the Worimi Nation of the Port Stephens area, and the Aboriginal advisory committee managing Clybucca midden on the mid north coast. DECC was able to assist several of these communities by providing dedicated areas on DECC-managed lands that are within traditional territory for the reburial of ancestral remains and return of other cultural material.

Aboriginal heritage program

The DECC Aboriginal heritage program contributes to immediate and long-term conservation and management outcomes for Aboriginal sites and places of significance and associated cultural information. It also aims to increase self-determination for Aboriginal communities in the management of Aboriginal heritage values and to improve community knowledge of Aboriginal heritage. Work on the program in 2003–04 included:

- recording and documenting the Aboriginal values of the new Mudjarn National Park on DECC South West Slopes region (Southern region)
- training Aboriginal women in undertaking cultural heritage surveys and recording women's sites for the Nandewar project in northern NSW (partially within the UNE and LNE regions)
- collating information about Aboriginal women's sites and use of natural resources in the Hunter Valley (LNE region)
- collecting oral histories on significant places within the traditional territory of the Bundjalung Nation on the far north coast (UNE region)
- assisting the Local Aboriginal Land Council with signs relating to cultural significance in the Coffs Harbour area (UNE region)
- locating unmarked graves at the Aboriginal mission cemetery at Rosebery on the South Coast using ground penetrating radar, allowing for the continued use of the land as a cemetery by the Aboriginal community (Southern region).

Aboriginal Cultural Heritage Advisory Committee

In March 2006, the Minister for Climate Change and the Environment appointed 11 members from across NSW to the Aboriginal Cultural Heritage Advisory Committee. The Minister hosted a two-day induction workshop at Parliament House on 11 and 12 May 2006 providing committee members with an opportunity to learn about the role and function of DECC and the Minister's expectations of the committee. DECC regards the committee as its principal advisory body on Aboriginal cultural heritage in NSW. The committee will contribute to the development of statewide policies, programs and approaches to Aboriginal cultural heritage management.

Public participation

Forest agreements and regional forest agreements

All NSW FAs must be put on public display before the endorsement by the relevant Ministers. Many other management plans and guidelines prepared under these agreements are also made available for public comment before they are completed.

The NSW FAs and RFAs also contain provisions for public access to information on and related to the NSW FAs. All reports carried out during the CRA for each region are publicly available through the Australian Government's RFA website (www.rfa.gov.au).

The public must be kept informed and given an opportunity to participate in each of the five-year reviews as required by legislation.

National parks

DECC supports and encourages public participation and involvement in policy development and decision making processes.

The National Parks and Wildlife Advisory Council was established under section 22 of the NPW Act. It provides advice relating to the care, control and management of DECC areas, particularly relating to management plans for national parks, nature reserves and historic sites. It is made up of up to 15 members appointed by the Minister for Climate Change and the Environment. The council represents various conservation, educational, scientific and natural resource management organisations with an interest in the management and use of DECC tenure.

In addition to the council, there are 20 regional national parks and wildlife advisory committees of regional stakeholder representatives to give advice about the care, control and management of DECC areas on a regional scale. Advisory committee members are also appointed by the Minister for Climate Change and the Environment.

The NPW Act allows for public exhibition of and consultation on management plans. Anyone may make representations to the Director General. The plan of management along with any representations will be forward to the advisory council for its consideration and advice before it is endorsed by the Minister for Climate Change and the Environment.

The TSC Act lists threatened species, populations and ecological communities; key threatening processes; critical habitats of endangered species, populations and ecological communities and any species presumed extinct. It also contains the public register of licences issued by the Director General of DECC.

The preparation of species recovery plans and threat abatement plans is a requirement under the TSC Act. All drafts are placed on public exhibition and the final versions are available to the public. Further details on these plans can be found under criterion 1.

In addition, the Wilderness Act allows the public to nominate land suitable for wilderness and to make written submissions about whether an area of land should be identified as wilderness. It also provides for public submissions on draft wilderness protection agreements. DECC exceeds the Act's requirements by placing wilderness assessment reports on public exhibition and actively seeking community input on both wilderness identification and declaration.

MIG Indicator 7.2 (narrative): Extent to which the institutional framework supports the conservation and sustainable management of forests (UNE, LNE, Eden, Southern regions)

Indicator 7.2.b Undertake and implement periodic forest-related planning, assessment, and policy review including cross-sectoral planning and coordination

Indicator 7.2.c Develop and maintain human resource skills across relevant disciplines

Indicator 7.2.e Enforce laws, regulation and guidelines

This indicator involves the assessment of processes which build institutional commitment to Ecologically Sustainable Forest Management.

DECC public education and awareness

A key objective for DECC is to work with the community to foster understanding and appreciation of, and commitment to, natural and cultural heritage. At 30 June 2004, the following programs are underway across NSW (with a focus on the NSW FA regions, where possible).

Learning for sustainability – NSW Environmental Education Plan

The NSW Council on Environmental Education is constituted under the *Protection of the Environment Administration Amendment (Environmental Education) Act 1998*. The role of the Council is to advise the Government on key issues, trends and research requirements relating to environmental education and to coordinate the preparation of statewide environmental education plans. The plan identifies the following outcome priorities:

- Improved integration of environmental education with other tools and strategies used by organisations to promote environmental sustainability. DECC has integrated environmental education into its conservation management and regulation activities and facilitates community involvement in voluntary conservation initiatives.
- Enhanced cross-sectoral coordination of environmental education programs. The role of the Environmental Education Coordination Network (EECN), of which DECC is a member, is to ensure coordination across sectors, to share learning, skills and resources, and to ensure efficient use of resources.
- education and involvement components of the NSW Biodiversity Strategy, including the development of teacher and student resource kits on state and national parks and biodiversity in partnership with the Department of Education and Training, and in consultation with other key agencies involved in biodiversity protection and conservation.

The DECC *Threatened Species SOS* program encourages state and local partnership initiatives in the implementation of threatened species recovery plans and threat abatement plans for key threatening processes.

School education programs

School education programs are conducted throughout NSW through the *Discovery for Schools* program. For example on the NSW south coast, in supporting delivery on the *Human Society in the Environment* (HSIE) syllabus, schools (mostly primary) have a choice of either visiting a park or reserve or having an education caravan visit the school. The program addresses all stages of the unit (wet and dry, rainforest, what is a national park, biodiversity, threatened species, Australian animals and Aboriginal culture).

The program has enabled thousands of school students to learn about managing our national parks, habitat protection, biodiversity and what they can do to assist. It involved students in projects, increased their knowledge, gave them a sense of ownership and provided the community with a rewarding experience resulting in greater understanding of parks and reserves.

Volunteers

Volunteers are essential partners in achieving conservation. Throughout NSW, numerous volunteers give many hours of work in conservation activities both on- and off-park. Volunteers participate in a range of activities, including bush regeneration, weed control, track maintenance, flora and fauna surveying and mapping, historic heritage restoration, and education.

Discovery program

The Discovery program promotes public participation in and awareness of biodiversity and cultural values by using interpretation techniques to bring natural and cultural heritage themes alive. The program employs local people as coordinators and rangers to deliver education programs in national parks and reserves, and conduct outreach activities in locations such as schools.

Envirothon

DECC Envirothon program is an environmental interpretation competition for Year 11 students in NSW public schools run in partnership with the Department of Education and Training, with prizes sponsored by Snowgum, the outdoor equipment company. More than 250 students compete in regional competitions and over 60 students and staff engaged in the final of the competition in Sydney.

Forests NSW public education and awareness

Forests NSW have a range of public education programs and activities relating to forest management. The majority of activities are developed through the Corporate Public Affairs Branch, although all regional staff are involved in communication and public consultation through attendance at meetings and forums. Forests NSW have developed two forest studies centres, providing educational opportunities for schools in Sydney and Newcastle (in the LNE region). The programs provided a fun enjoyable day out for teachers and students as well as providing an overview of forest management and forest ecology. All programs were related to NSW Department of Education syllabus documents and designed and run by qualified teachers and rangers.

Forests NSW education programs attract over 6000 students and teachers annually. The forest studies centres provided programs for all classes K-12, guest lecturers and field trips for TAFE and tertiary groups. Each centre has facilities for up to 60 students per day. They run programs in the forest or at the school, have worksheets tailored to field activities, distribute free teacher resource packs, offer education publications for sale, and a kids and schools website with interactive wild forest adventures, information and notes for teachers.

Cumberland State Forest at West Pennant Hills, Sydney, continues to be to focal point of the Forests NSW education program providing hands-on experience for a range of school and community groups in and around Sydney and information for the general public about NSW forestry.

The forest-based education program for years 3 to 6 has focused on key curriculum areas through modules such as 'Rainforests' and 'Discovering the State's forests'. The public can access specialised Forests NSW information through its library and information services based at its Research and Development Division, West Pennant Hills. The library collection includes information about the core business of forestry science and research including carbon sequestration, ecology, environmental issues, forest management, new forests, nursery management, silviculture, and soil salinity and management.

Reporting frameworks

State of the Parks

The issue of protected area management effectiveness is receiving increasing attention throughout Australia and around the world, with a number of states developing protected area management assessment systems in recent years. This reflects the increasing trend in Government for a shift towards an outcome-based management focus, providing for increased agency accountability to both Government and the community, as well as informing the adaptive management of protected areas and allowing targeted resource allocation to improve management performance and project planning.

DECC has developed a performance-based reporting framework, known as the State of the Parks program, which is intended to be a major driver for achieving:

- effective and responsive park management decision-making
- systematic and transparent links between management objectives and actions
- transparent allocation of funding and resources to achieve outcomes
- strong partnerships with communities, and
- effective communication of our management performance to the community.

Environmental management system

Forests NSW have developed and implemented an environmental management system (EMS). Major components are:

- ESFM plans: regional management plans
- FMZ system: classification of forest areas identifying those to be managed primarily for conservation or timber production
- Eco-field guides: interpretative guides to assist planning and operational activities
- Forest resource and management evaluation system (FRAMES): inventory and scheduling tool, and
- silvicultural manual: guidelines for application of silviculture.

Human resource development

Forests NSW staff

Training and staff development underpins the achievement of ESFM and helps Forests NSW provide a safe, productive and progressive workplace. The quality of management is assessed using a number of indicators.

Forests NSW consider employee skill and competency development as an investment in people and essential to the continued success of the organisation and the career growth of employees. The quality of personnel management is reflected in opportunities provided to staff for development and training. Indicators include expenditure on human resource management and staff training.

In 2003–04, for example, Forests NSW spent over \$2.4 million on human resource management services. This includes all activities associated with the management of personnel, including policy, recruitment and general administration of staff. In 2002–03, over 1800 training and development courses were undertaken by staff and contractors, at a cost of over \$2.6 million. These courses were primarily in the areas of occupational health and safety, first aid, recognition and protection of environment and cultural heritage values, and soil and water training.

Health and safety

Forests NSW aims to achieve the best safety and rehabilitation record in the Australian forestry industry measured through a reduction of the accident frequency rate, the lost time severity rate and days lost from workplace accidents.

Forests NSW has a duty of care to ensure it provides its staff with the training, information, equipment and competence to do their jobs safely. As part of this:

- Forests NSW ran a large health, safety and fitness program in all regions.
- A major initiative, the Driving Smarter program aims to increase driver awareness and defensive driving practices.
- The Fire Fighter Health and Fitness program was implemented during the reporting period. Fire fighting is arduous and mentally fatiguing requiring a high standard of health and fitness. The Fire Fighter Health and Fitness program involves medical assessments, fitness testing and fitness improvement methods.

DECC staff

One of the key objectives is to attract, develop and retain a skilled workforce aligned to corporate values and directions.

At 30 June 2004, the Parks and Wildlife Group of DECC employed 1415 staff³⁵ across a broad range of employment categories.

At 1415, the number of DECC employees is different from 1937 in 2002–03 due to the creation of the Department of the Environment and Conservation on 24 September 2003, where corporate services, science, policy and regulatory staff are now located in different Divisions and Groups of the Department, so the numbers are not comparable. The core of the former NPWS which continues its role in management of the NSW reserve system, continues to operate under the title of NPWS but is known as the Parks and Wildlife Division within the broader DECC.

The skill base of staff is important information when assessing the human resource skills of the agency. The most common training programs undertaken by staff are OH&S and field skills, reflecting the agency's emphasis on park management.

The Aboriginal Employment and Development Strategy aims to create new opportunities for Aboriginal people, provide career development and training for existing Aboriginal staff and attract new Aboriginal staff through initiatives such as traineeships.

Enforcement of laws, regulations and guidelines

DECC auditing

Where a NSW FA is in place, timber harvesting activities undertaken on state forests and other Crown timber land are required to comply with the IFOA for the region. Four IFOAs were in place in NSW covering the UNE, LNE, Eden and Southern regions. Each IFOA contains non-licence terms and three licences which set out conditions with which timber harvesting activities must comply. During the reporting period the three licences were administered by DECC (including NPWS and EPA) and DPI Fisheries. Each agency carried out regular audits of harvesting activities (pre-harvest and operational, and administrative). Auditing functions for the EPL and threatened species licence are now undertaken by DECC.

Both reactive investigations in response to complaints from the public, and proactive audit investigations are undertaken.

³⁵ These data include all NPWS employees across NSW and are therefore not specific to the FA regions

Investigations by DECC staff included field inspections, desk-top assessments, discussions and correspondence with relevant Forests NSW personnel. In the case of complaints, each complainant is advised of the progress of investigations into their complaint in accordance with the agency coordinated forestry complaint handling protocol.

Details of the Auditing program were presented against Milestone 31.

Forests NSW auditing

Part of the Forests NSW ongoing internal audit program involves conducting compliance checks to ensure the conditions set out in the IFOA are being met.

2000–01

DECC received 14 complaints about alleged breaches of the TSL in the UNE region during the reporting period. There were five complaints regarding alleged breaches of the TSL in the LNE region for the same period. , and these allegations are being investigated. No complaints about alleged non-compliance were received by DECC for the Eden region in 2000–01. The department, and its predecessors, investigates all complaints.

On a region by region basis, results of compliance checks across the UNE region remained relatively steady, with only small variations from the number of incidents recorded during 1999–2000. The largest variation was a decrease in the number of incidents related to safety and other issues. The total number of incidents of this nature fell from 11% during 1999–2000 to 4% during 2000–01.

The Environment Protection Authority issued two fines against Forests NSW in the LNE region in 2000–01.

2001–02

During 2001–02, 20 comprehensive audits of Forests NSW pre-operational and operational activities, covered by an IFOA were conducted. Results of these audits identified 170 breaches across the UNE, LNE and Eden regions. Specifically:

- seven operational and planning audits were undertaken in the UNE region, identifying 79 breaches of licence conditions
- eight operational and planning audits were undertaken in the LNE region, identifying 55 breaches of licence conditions
- five operational and planning audits were undertaken in the Eden region, identifying 36 breaches of licence conditions.

2002–03

DECC carried out 10 audits (field and desk-top) of compliance with the TSL across the UNE, LNE, Eden and Southern regions. The audits identified four contraventions of the TSL. Of these, one contravention was identified in the UNE region and one in the LNE region. In the Eden region one contravention was also identified. In the Southern region, one contravention was also identified, but was withdrawn.

DECC received 11 complaints from the public regarding alleged breaches of the TSL during the year. Six of the complaints received were related to activities in the UNE region, three related to activities in the LNE region, and two related to activities in the Southern region. No complaints were received related to compliance with the licence in the Eden region.

The EPL made under the POEO Act requires practical measures to be taken to protect the aquatic environment from water pollution caused by forestry activities. Non-compliance with conditions of the licence is dealt with through meetings with senior Forests NSW officers, issuing feedback or warning letters, clean-up notices, penalty notices or prosecution actions.

During 2002–03, 19 audits (pre-operational and operational) on state forests identified 232 contraventions of licence conditions. This figure did not include breaches identified in one audit that was still underway in the LNE region. For determined breaches, action taken included the issuing of a penalty notice, warning letters, clean-up notices and the undertaking of remedial work by Forests NSW.

There were two more audits of Forests NSW complaint, compliance and operations registers (one each in the UNE and Southern regions) which identified 382 breaches followed up with one penalty notice issued in the UNE region and a warning letter in the Southern region.

2003–04

During the reporting period, DECC received eight new complaints from the public concerning alleged breaches of the IFOA TSL for the UNE region. The above total of eight complaints covered five separate harvesting operations. In response to these complaints, breaches to two separate TSL conditions were identified during 2003–04 and relevant enforcement actions were undertaken.

During 2003–04, DECC received one new complaint from the public concerning alleged breaches of the TSL for the LNE region. This matter did not relate to a harvesting operation but rather to management of fire within the habitat of a threatened species. Subsequent investigation did not identify any breaches of the TSL.

One proactive field audit was undertaken by the DEC during 2003–04 in the LNE region. This identified two apparent contraventions of the TSL. One proactive desktop audit was undertaken which found numerous breaches of the TSL. Forests NSW was issued with a warning in regard to these matters.

DECC received two new complaints from the public concerning alleged non-compliances of the TSL for the Eden region. Subsequent investigations did not identify any non-compliances of the TSL.

One proactive field audit was undertaken by DECC during 2003–04 in the Eden region. This identified one minor non-compliance of the TSL in relation to marking of habitat and recruitment trees. No further action was undertaken.

During 2003–04, DECC received three new complaints from the public concerning alleged non-compliances of the TSL in the Southern region. Subsequent investigations did not identify any non-compliances of the TSL.

Four proactive field audits were undertaken by DECC in the Southern region. No significant non-compliances of the TSL were found.

2004–05

In the UNE region, EPL coverage applied to 43 separate forestry operations during the period. There were 119 operations where harvesting occurred without EPL coverage. The TSL applied to 162 forestry operations during the period in the region.

DECC conducted three proactive operational and/or planning audits of forestry operations in the UNE region for this period, identifying a total of 63 non-compliances with licence conditions. Sixty-one non-compliances relating to the EPL requirements were identified. These non-compliances included inadequate pre-operational planning, instances where trees had been harvested within riparian protection zones, snig track crossbanks that were blocked or ineffective and snig track crossings not drained or not rehabilitated in accordance with the best-practice licence conditions. Non-compliance with TSL conditions included not retaining sufficient habitat trees.

DECC also received and investigated two community complaints about water pollution and threatened species breaches in the UNE region. As a result of these audits and investigations,

DECC provided feedback and sent two warning letters to Forests NSW outlining the issues of non-compliance identified. DECC also required that expert soil conservation advice be sought on two occasions and that remedial work be carried out at five locations. One penalty notice was issued following an audit in UNE region.

In the LNE region EPL coverage applied to 41 separate Forests NSW operations. There were 114 operations where harvesting occurred without EPL coverage. The TSL applied to 155 forestry operations in the region during the period.

DECC conducted three operational and planning audits of forestry operations in the region that identified 66 non-compliances of EPL best practice conditions. These included inadequate pre-operational planning, inadequate road drainage on the approaches to stream crossings, harvesting and burning within stream riparian zones and not discharging road drainage onto stable surfaces. Twenty-seven non-compliances were recorded against the TSL, which included inadequate pre-operational planning, not retaining sufficient habitat trees, harvesting within stream exclusion zones and felling a tree within mapped high-conservation-value old-growth forest.

DECC also received two community complaints about potential water pollution and threatened species breaches in the LNE region. Both these matters resulted in field audits by DECC. As a result of these audits in the LNE region, DECC provided feedback and sent three warning letters to Forests NSW regarding non-compliance with licence conditions. Forests NSW was required to carry out remedial work at seven sites and seek expert soil conservation advice on two occasions. Following the receipt of soil conservation advice, DEC issued Forests NSW with a clean-up notice on each occasion. Two penalty notices have been issued after an audit in the LNE region and regulatory action is outstanding for a separate audit.

DECC also finalised prosecution action about a collapsed road in Chichester State Forest that occurred in May 2003. Forests NSW pleaded guilty to the offence of water pollution, received a \$30,000 fine and was required to pay DECC costs by the Land and Environment Court.

EPL and TSL coverage applied to 98 separate Forests NSW operations in the Eden region. DECC conducted four operational and/or planning audits within the region and identified a total of 17 non-compliances with licence conditions. All 17 non-compliances related to the Environment Protection Licence, including inadequate pre-operational planning and drainage outlets on roads that were blocked.

DECC also received three new community complaints about potential water pollution and threatened species breaches in the Eden region. All these matters resulted in field audits by DECC. As a result of these audits, DECC provided feedback to Forests NSW and issued two warning letters regarding non-compliance with the EPL for the Eden region. DECC required Forests NSW to carry out remedial work at five sites and seek expert soil conservation advice on one occasion.

EPL coverage applied to 61 separate Forests NSW operations in the Southern region covering 16 operations where harvesting occurred without EPL coverage. The TSL applied to 77 forestry operations during the period in the region.

DECC conducted two audits of operational and planning activities undertaken by Forests NSW. DECC identified one non-compliance with planning requirements of the EPL and one audit is still outstanding.

DECC received and investigated three new community complaints about potential water pollution and threatened species breaches in the Southern forest region.

As a result of these audits and investigations, DECC required Forests NSW to carry out remedial work at one site. Regulatory action for one audit was still outstanding at the end of 2004–05.

2005–06

In the UNE region, EPL coverage applied to 38 separate forestry operations, there were 171 operations where harvesting occurred without EPL coverage, and the TSL applied to 209 forestry operations. DECC made one audit, as a result of a community complaint regarding water pollution and threatened species breaches. The audit identified 12 non-compliances with licence conditions.

There were seven non-compliances related to the EPL requirements, which included:

- eroding road batters
- an unstable snig track crossing
- instances where trees had been harvested within filter strips.

In the UNE Region, DECC identified five non-compliances with TSL conditions, including:

- damage to retained trees
- debris piled against retained trees, and
- riparian habitat protection zones not marked and subject to harvesting.

As a result of the audit, DECC provided verbal feedback and sent a warning letter to Forests NSW outlining the issues of non-compliance identified. DECC also required that expert soil conservation advice be sought for four sites and that remedial work be carried out at five locations.

In the LNE region, the EPL applied to 27 forestry operations, there were 131 operations where harvesting occurred without EPL coverage, and the TSL applied to 158 forestry operations.

During 2005–06 DECC conducted four audits. Two audits were proactive and the other two were reactive. These audits identified 155 non-compliances of the EPL best-practice conditions including:

- eroding and slumping road batters
- trees felled from within and into filter strips
- inadequate road drainage on the approaches to stream crossings
- inefficient soil erosion and sediment control measures
- road drainage not discharging onto stable surfaces.

In the LNE region, DECC identified 19 non-compliances against the TSL, which included:

- not keeping a non-compliance register
- felling trees into and from within the protection zone
- retaining poor-quality and damaged trees.

DECC also received four community complaints regarding potential water pollution and threatened species breaches in the LNE forest region. Two of these matters resulted in field audits by DECC, one prompted a community field day and the other was resolved with a clarification letter.

As a result of these auditing activities in the LNE region, DECC provided feedback and sent three warning letters to Forests NSW regarding non-compliance with licence conditions. Forests NSW was required to undertake remedial work at 29 sites and seek expert soil conservation advice on seven occasions and provide an engineering assessment for one site.

DECC issued Forests NSW with one clean-up notice and three penalty notices. During 2005–06 DECC also issued Forests NSW with one clean-up notice and three penalty notices for audits made in 2004–05.

In the Southern region, EPL coverage applied to 27 forestry operations in the Southern region, there were 62 operations where harvesting occurred without EPL coverage and the TSL applied to 89 forestry operations.

During 2005–06, DECC made two proactive audits of Forests NSW operational and planning activities. These audits identified 87 non-compliances with the environment protection licence, including:

- inadequate road drainage adjacent to crossings
- road drainage not diverting on to stable surface
- tree felled into filter strip, and
- failure to record commencement and cessation dates for roads and crossings.

DECC identified 20 non-compliances with the TSL, which included:

- retained trees felled
- logging debris piled against retained trees
- tree felled in protection zone, and
- register of non-compliances not kept.

DECC received four community complaints regarding potential water pollution and threatened species breaches in the Southern forest region. These matters were resolved by DECC. As a result of these auditing activities in the Southern forest region, DECC provided feedback and sent two warning letters to Forests NSW regarding non-compliance with licence conditions. Forests NSW was required to undertake remedial work at 14 sites and seek expert soil conservation advice on one occasion.

The EPL applied to 119 forestry operations and the TSL applied to 119 forestry operations in the Eden region. There were no operations where harvesting occurred without EPL coverage.

DECC conducted one proactive audit within the region and identified a total of 91 non-compliances with licence conditions. Of these, 83 non-compliances were with the EPL and included:

- road drainage not diverting on to stable surface
- snig track drainage exceeding specified distances
- inadequate planning of roads and crossings.

DECC identified eight non-compliances with the TSL, which included:

- lack of targeted surveys for species
- logging debris in exclusion zone
- logging debris piled against retained trees.

DECC received one community complaint regarding potential water pollution and threatened species breaches in the Eden forest region. This matter was resolved by DECC.

As a result of these audits, DECC provided feedback to Forests NSW and issued one warning letter regarding non-compliance with the EPL and TSL. Forests NSW was issued with one clean-up notice, was required by DECC to undertake remedial work at eight sites, and seek expert soil conservation advice on one occasion.

Monitoring changes in conservation and sustainable management

MIG indicator 7.4 (narrative): Capacity to measure and monitor changes in the conservation and sustainable management of forests (UNE, LNE, Eden, Southern regions)

The indicator aims to improve the capacity to measure and monitor changes in conservation and the sustainable management of forests by identifying research priorities and by ensuring up-to-date data and other relevant information for effective criteria reporting.

Forests NSW and DECC currently report against the following processes:

- ESFM criteria and indicators
- triple bottom line assessment – *Seeing* report
- *State of the Parks* report

DECC and Forests NSW are also required to contribute to a range of other reports:

- RFA annual reports (<http://www.daff.gov.au>)
- NSW FAs implementation reports (<http://www.decc.nsw.gov.au>)
- *State of the Forests* reports (<http://www.daff.gov.au>), and
- *State of the Environment* reports (<http://www.decc.nsw.gov.au>).

ESFM criteria and indicators

The ESFM criteria and indicators are the main tool by which changes in forest values are monitored over time in the NSW FA regions. Monitoring is carried out to measure the effectiveness of management practices and improvements to the Forests NSW forest estate. The quality of the data has been improving through better collection systems. The appropriateness of the indicators (developed during the CRA/RFAs for each region) is being evaluated as part of the first five-year review of the FAs and IFOAs. This review will determine how well the indicators provide information on changes in forest values.

The MIG criteria and indicators, on which the ESFM criteria and indicators are largely based, were reviewed nationally in 2004. Outcomes of this review were considered as part of the review of the ESFM criteria and indicators to ensure an alignment of the two monitoring streams.

Regional monitoring at the regional scale is complemented by the DECC *State of the Parks* reporting system and Forests NSW *Seeing* reporting.

Seeing report

Since 1998, Forests NSW has produced an environment and social values report building on the criteria and indicators set out in the Montreal Process. In the 2000–01 financial year, Forests NSW made significant advances towards producing an integrated social, environmental and economic (*Seeing*) report to meet the corporate objective of triple bottom line reporting. The reporting process expanded the range of indicators beyond those provided by the Montreal Process to include a wider range of social and economic indicators.

The Social, Economic and Environmental Database System (SEEDS), developed during 2001–02 to support the Forests NSW performance monitoring and reporting process, is operational in all Forests NSW regions. It provides a valuable tool to collect consistent data across regions for a range of indicators, and facilitates a regional and corporate review of planning, policy, and management activities.

State of the Parks report

DECC published the inaugural *State of the Parks* report in 2001, representing the first stage in the development of the reporting framework. This report provides an overview of the conservation values of the NSW reserve system, the means by which these values are protected and profiles of a key set of parks across NSW.

The *State of the Parks* framework consists of:

- a detailed set of data-dependant indicators of management effectiveness that are being applied to a sample of parks, at least one park per region, throughout NSW

- a complementary system of simpler qualitative measures, to be applied as a questionnaire undertaken annually in a large sample of NSW parks
- an independent review process for the data prior to publications, and
- linkages to the plan of management process.

Indicator 7.4.a Availability and extent of up-to-date data, statistics and other information important to measuring or describing indicators associated with criteria 1-7

Information for this indicator is available in this report under each of the reporting criteria.

Indicator 7.4.b Scope, frequency and statistical reliability of forest inventories, assessments, monitoring and other relevant information

No data was provided for this indicator over the reporting period.

Research and management

MIG indicator 7.5 (narrative); Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services (UNE, LNE, Eden and Southern regions)

Indicator 7.5.d Enhancement of ability to predict impacts of human intervention on forests

Indicator 7.5.f Per cent of native forests and plantations that are formally supported by silvicultural and utilisation research support

Forests NSW research and development objectives were delivered primarily through its Research and Development Division until July 2004. The science and research functions were transferred to the Department of Primary Industries (except tree and plantation improvement) at that time. The division's primary focus was on innovative scientific development in fields which can add value to the planted forests, investment services and native forest businesses of the organisation. Significant work has identified the benefits of planted forests for such purposes as carbon sinks, mine site rehabilitation, biodiversity enhancement and the development of sustainable land-use practices for salinity prone areas. For details on research activities refer to the Forests NSW website <http://www.dpi.nsw.gov.au/research/forestry>

The Department of Environment and Climate Change continues to conduct a range of research activities, and produced a range of works which can be purchased online through the online NSW Government bookshop at <http://www.bookshop.nsw.gov.au/>. Research is also detailed on the DECC website at <http://www.environment.nsw.gov.au/research/index.htm>

Bibliography

- Binns DL & Bridges RG (2003). *Ecological impacts and sustainability of timber harvesting and burning in coastal forests of the Eden area: Establishment and progress of the Eden Burning Study: Technical Paper 67*, Research and Development Division, State Forests of New South Wales, Sydney.
- Bridges RG (2005). *Effects of logging and burning regimes on overstorey species of dry sclerophyll forests in south-eastern NSW: Initial results 1986–1993 from the Eden Burning Study Area: Research Paper No. 40*, Forests Resources Research, NSW Department of Primary Industries, Sydney.
- Commonwealth of Australia (1992). *National Forest Policy Statement: a New Focus for Australia's Forests*, Commonwealth of Australia, Canberra.
- Commonwealth of Australia (1997). *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia*, A Joint Report by the ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee, Commonwealth of Australia, Canberra.
- Commonwealth of Australia (1998). *A Framework of Regional Sub-national Level Criteria and Indicators of Sustainable Forest Management in Australia*, Montreal Implementation Group, Department of Agriculture, Fisheries and Forestry, Canberra.
- Commonwealth of Australia (2007). *Australia's Sustainable Forest Management Framework of Criteria & Indicators 2007 – Policy Guidelines*, Department of Agriculture, Fisheries and Forestry, Canberra.
- Commonwealth of Australia & the State of New South Wales (1999). *Eden Regional Forest Agreement*, August 1999, Commonwealth of Australia & State of New South Wales, Canberra and Sydney.
- Commonwealth of Australia & the State of New South Wales (2000). *Regional Forest Agreement for North East New South Wales Upper North East and Lower North East Regions*, March 2000, Commonwealth of Australia & State of New South Wales, Canberra and Sydney.
- Commonwealth of Australia & the State of New South Wales (2001). *Regional Forest Agreement for Southern New South Wales*, April 2001, Commonwealth of Australia & State of New South Wales, Canberra and Sydney.
- Department of Environment and Conservation NSW (2005). *State of the Parks 2004*, Department of Environment and Conservation, Sydney South.
- Department of Infrastructure Planning and Natural Resources (2004a). *Vegetation management in NSW: Profile of plantation authorisations in NSW since December 2001*, NSW Department of Infrastructure Planning and Natural Resources, Sydney.
- Department of Infrastructure Planning and Natural Resources (2004b). *Plantation Regulation in NSW: Vegetation Management in NSW*, March 2004, NSW Department of Infrastructure Planning and Natural Resources, Sydney.
- Drielsma M, Mantle K, & Coulson S (2003). *A Method for Measuring and Monitoring Fragmentation: an Example from North East NSW*, April 2003, GIS Research and Development, NSW National Parks and Wildlife Service, Hurstville.

- Ecologically Sustainable Forest Management Group (1998a). *Criteria and Indicators in the Eden Region, A project undertaken as part of the NSW Comprehensive Regional Assessments*, Resource and Conservation Division, Department of Urban Affairs and Planning, Sydney.
- Ecologically Sustainable Forest Management Group (1998b). *Ecologically Sustainable Forest Management for the Eden RFA Assessment, A project undertaken as part of the NSW Comprehensive Regional Assessments*, Resource and Conservation Division, Department of Urban Affairs and Planning, Sydney.
- Ecologically Sustainable Forest Management Group (1999a). *ESFM Technical Framework. A project undertaken as part of the NSW Comprehensive Regional Assessment*. Resource and Conservation Division, NSW Department of Urban Affairs and Planning, Sydney.
- Ecologically Sustainable Forest Management Group (1999b). *Criteria, Indicators, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for the Upper North East and Lower North East RFA regions: a project undertaken as part of the NSW Comprehensive Regional Assessments*, Resource and Conservation Division, NSW Department of Urban Affairs and Planning, Sydney.
- ESFM Technical Committee (2000). *Criteria, Indicators, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for Southern RFA Region: A Project Undertaken as Part of the NSW Comprehensive Regional Assessments Project Number NA 41/ESFM*, Resource and Conservation Division, Department of Urban Affairs and Planning, Sydney.
- Flint L (2002). 'REDEN – a forestry software package for the future', *The Bush Telegraph*, May–July 2002, State Forests of New South Wales, Sydney.
- Forestry Commission of NSW (1989). *Research Note 17: Forest Types in New South Wales*, Forestry Commission of NSW, Sydney.
- Forests NSW (2000). *Field Guide to Forest Management in North East NSW*. Forests NSW, Sydney
- Forests NSW (2003). 'Forest Practices Circular (FPC) 2003/01: Monitoring and Audit Compliance of Operations' (unpublished), Forests NSW, Sydney.
- Forests NSW (2004a). *Review of Wood Resources on the North Coast*, Forests NSW, Sydney.
- Forests NSW (2004b). *Sustaining the Forest: Social, Environmental and Economic (Seeing) Report 2003/04*, Forests NSW, Sydney.
- Forests NSW (2004c). *Sustaining the Forest: Social, Environmental and Economic (Seeing) Report 2004/05*, Forests NSW, Sydney.
- Forests NSW (2005a). *ESFM Plan for the South Coast – Southern NSW*, Forests NSW, Sydney.
- Forests NSW (2005b) *Field Guide to Flora, Fauna and Heritage Features of Forests Management on the South Coast of NSW*. Forests NSW, Sydney.
- Forests NSW (2005c). *Sustaining the Forest: Social, Environmental and Economic (Seeing) Report 2005/06*, Forests NSW, Sydney.
- Forests NSW (2006a). *Forest Practices Circular (FPC) 2006/17: Monitoring and Audit Manual*, Forests NSW, Sydney.

- Forests NSW (2006b). *North East Region: Weed Management Plan*, Department of Primary Industries/Forests NSW, Sydney.
- Forests NSW (2007a). *Pest Animal Management Plan 2006: Central Region*, Forests NSW, Sydney.
- Forests NSW (2007b). *Pest Animal Management Plan 2006: North East Region*, Forests NSW, Sydney.
- Forests NSW (2007c). *Weed Management Plan 2006: Central Region*, Department of Primary Industries/Forests NSW, Sydney.
- Forests NSW (2007d). *Weed Management Plan 2006: Southern Region*, Department of Primary Industries/Forests NSW, Sydney.
- Forests NSW (2008a). *Australian Forestry Standard and Environmental Management System Manual*, Forests NSW, Sydney.
- Forests NSW (2008b). *Corporate Fuel Management Plan*, Forests NSW, Sydney.
- Forests NSW (2008c). *Model Regional Fuel Management Plan*, Forests NSW, Sydney.
- Forests NSW (2008d). *West Pennant Hills Region HRB Operational Plan 02/07*, Forests NSW, Sydney.
- Forward LR & Hall RM (1997). 'Alps Vegetation Fire Response Monitoring System: Final Project Report', Report to New South Wales National Parks and Wildlife Service, Snowy Mountains Region, Heritage Unit (unpublished).
- Griggs DJ & Callender BA (eds) (1996). *IPCC Guidelines for National Greenhouse Gas Inventories PCC/OECD/IEA*, United Kingdom Meteorological Office, Bracknell.
- IUCN (1994). *Guidelines for Protected Area Management Categories*, IUCN Commission on National Parks and Protected Areas with the assistance of the World Conservation Monitoring Centre, IUCN, Gland, Switzerland.
- Joint ANZEC/MCFFA National Forest Policy Statement Implementation Sub-committee (1997). *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia*, Commonwealth of Australia, Canberra.
- Keith DA, Miles J & Mackenzie BDE (1999). 'Vascular flora of the South East Forests Region, Eden, NSW' *Cunninghamia* 6 1: 219–281.
- Lane PNJ & Mackay SM (2001). 'Streamflow response of mixed-species eucalypt forests to patch cutting and thinning treatments', *Forest Ecology and Management* 143 2001: 131–142.
- Montreal Implementation Group (1998). *A Framework of Regional Sub-national Level Criteria and Indicators of Sustainable Forest Management in Australia*, Department of Agriculture, Fisheries and Forestry, Canberra.
- National Forest Inventory (2002). *National Plantation Inventory Annual Update – March 2002*, Bureau of Resource Sciences, Canberra.
- National Forest Inventory (2003a). *Australia's State of the Forests Report 2003*, Bureau of Rural Sciences, Canberra.

- National Forest Inventory (2003b). *National Plantation Inventory Annual Update – March 2003*, Bureau of Resource Sciences, Canberra.
- New South Wales Government (1999a). *Forest Agreement for the Eden Region*, 5 March 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (1999b). *Forest Agreement for the Lower North East Region*, 5 March 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (1999c). *Forest Agreement for the Upper North East Region*, 5 March 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (1999d). *Integrated Forestry Operations Approval for the Eden Region*, December 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (1999e). *Integrated Forestry Operations Approval for the Lower North East Region*, December 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (1999f). *Integrated Forestry Operations Approval for the Upper North East Region*, December 1999, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (2002a). *Forest Agreement for the Southern Region*, 3 May 2002, NSW Department of Urban Affairs and Planning, Sydney.
- New South Wales Government (2002b). *Integrated Forestry Operations Approval for the Southern Region*, 3 May 2002, NSW Department of Planning, Sydney.
- NSW National Parks and Wildlife Service (1998a). *Forest ecosystem classification and mapping for the Eden Comprehensive Regional Assessment: A project undertaken as part of the NSW Comprehensive Regional Assessment*, Resource and Conservation Division, NSW Department of Urban Affairs and Planning, Sydney.
- NSW National Parks and Wildlife Service (1998b). *Old growth forest related projects for the Eden Comprehensive Regional Assessment: A project undertaken as part of the NSW Comprehensive Regional Assessment*, Resource and Conservation Division, NSW Department of Urban Affairs and Planning, Sydney.
- NSW National Parks and Wildlife Service (1999a). *Forest ecosystem classification and mapping for the Hunter Sub-region in the Lower North East Comprehensive Regional Assessment: A project undertaken as part of the NSW Comprehensive Regional Assessment*, Resource and Conservation Division, Department of Urban Affairs and Planning, Sydney.
- NSW National Parks and Wildlife Service (1999b). *Forest ecosystem classifications for Upper and Lower North East CRA Regions: A project undertaken as part of the NSW Comprehensive Regional Assessment*, Resource and Conservation Division, NSW Department of Urban Affairs and Planning, Sydney.
- NSW National Parks and Wildlife Service (1999c). *NSW Biodiversity Strategy*, National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (1999d). *Old growth forest related projects – UNE/LNE Regions: A project undertaken as part of the NSW Comprehensive Regional Assessment*, Resource and Conservation Division, Department of Urban Affairs and Planning, Sydney.

- NSW National Parks and Wildlife Service (2001a). *State of the Parks 2001* NSW National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (2001b). *Threat abatement plan for predation by the Red Fox *Vulpes vulpes**, NSW National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (2002). *Warrumbungle Brush-Tailed Rock Wallaby Endangered Population Recovery Plan*, NSW National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (2003a). 'Key Habitats and Corridors in North East NSW', *Pacific Conservation Biology* 8.
- NSW National Parks and Wildlife Service (2003b). *Horse management plan for the alpine area of Kosciuszko National Park, January 2003 – January 2005*, NSW National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (2003c). *Saving our threatened native animals and plants: Recovery and threat abatement in action*, National Parks and Wildlife Service, Hurstville.
- NSW Rural Fire Service (2003). '2002–2003 Fire Season Statistics' <http://www.rfs.nsw.gov.au/index.cfm?cid=40&thestart+18>
- O'Connell DA & Ryan PJ (2002). 'Prediction of three key hydraulic properties in a soil survey of a small forested catchment', *Australian Journal of Soil Research*, 40: 191–206.
- Penman TD; Kavanagh RP; Binns DL & Melick DR (2007). 'Patchiness of prescribed burns in dry sclerophyll eucalypt forests in south-eastern Australia', *Forest Ecology & Management*, 252:24–32.
- Penman TD; Binns DL & Kavanagh RP (2008a). 'Quantifying successional changes in response to forest disturbances' *Applied Vegetation Science*, 11: 261–268.
- Penman TD; Binns DL; Shiels RJ; Allen RM & Kavanagh RP (2008b). 'Changes in understorey plant species richness following logging and prescribed burning in shrubby dry sclerophyll forests of south-eastern Australia', *Austral Ecology*, 33: 197–210.
- Roberts S; Vertessy R; and Grayson R (2001) 'Transpiration from *Eucalyptus sieberi* L. Johnson forests of different age'. *Forest Ecology and Management*, 143: 153–161.
- Snowden P; Raison J; Keith H; Montagu K; Bi H; Ritson P; Grierson M; Adams M; Burrows W; Eamus D (2001). *Protocol for sampling tree and stand biomass. national carbon accounting system: Technical report no. 31*, Commonwealth of Australia, Canberra.
- State Forests of New South Wales (1999a). *Forest practices code, part 4, forest roads and fire trails*, State Forests of New South Wales, Sydney.
- State Forests of New South Wales (1999b). *Managing our forests sustainably: forest management zoning in NSW state forests*, State Forests of New South Wales, Sydney.
- State Forests of NSW (2000a). *Native forest silviculture manual*, State Forests of NSW Sydney.
- State Forests of NSW (2000b). *The price system*, State Forests of NSW, Sydney.

- State Forests of NSW (2000c). *Managing our forests sustainably: forest management zoning in NSW State Forests*, State Forests of NSW, Sydney.
- State Forests of NSW (2002a). *Annual report 2001–2002*, State Forests of NSW, Sydney.
- State Forests of NSW (2002b). 'Forest Practices Circular 2002/3: Implementation of IFOA silviculture in the Southern Forest Agreement Region' (unpublished), State Forests of NSW, Sydney.
- State Forests of NSW (2002c). *Forest Practices Circular 2002/3: Implementing silviculture in LNE and UNE*, State Forests of NSW, Sydney.
- State Forests of NSW (2003). *Annual report 2002–2003*, State Forests of NSW, Sydney.
- State Forests of NSW (2005). *Forest Practices Circular 2005/02: Rainforest protocol*, State Forests of NSW, Sydney.
- Vanclay JK (2002). *Review of projected timber yields for the NSW North Coast, Southern Cross University NSW*, Report to State Forests of NSW, Sydney.
- Wall J (2001). 'Identification and Classification of Potential Reforestation Areas in National Park Estate in NSW' (unpublished), NSW National Parks and Wildlife Service, Hurstville.

Appendix 1: Items for the review and review conclusion

The various categories under 'Review conclusion' mean:

- Completed – has been undertaken and will not be discussed in any future review
- Concluded – is concluded or is no longer being undertaken and will not be discussed in any future review
- Underway – has started but not completed. Will be discussed in the next review
- To be done – is still to occur
- Not applicable – is not relevant for this review
- Not required until second five-year review – milestone is not required until then

A. Eden RFA milestones

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
6	The parties to determine the process for extending the agreement for a further period	As part of the third five-yearly review	Not applicable	1
17	The parties to develop and consider regional development initiatives to be funded from unspent Commonwealth and State funds committed under the South East Forest Agreement	Within six months of signing this agreement	Completed	11
37	Parties to report annually on the achievement of milestones in this agreement	Annually for the first five years	Completed	5
40	The parties to determine the mechanism for the five-year review	Before the end of the five-year review period	Completed	2
46(b)	New South Wales to complete and publish plans of management for areas dedicated under the <i>National Parks and Wildlife Act 1974</i> (NSW)	By 1 January 2002	Underway	18
46(c)	New South Wales to complete and publish a regional ESFM plan for State forests	By 1 April 2000	Completed	36
46(d)	New South Wales to implement the forest management zoning system for the Eden region	By 1 October 1999	Completed	37
46(f)	New South Wales to develop and implement an inventory system for regrowth forests and review the calculation of sustainable yield, using methods consistent with attachment 11 and the principles and processes used in the Forest Resource and Management Evaluation System (FRAMES)	In time for the first five-yearly review	Inventory – Underway ----- Review sustainable yield – Underway	49 ----- 53
46(g)	New South Wales to grant an integrated forestry operations approval covering the Eden region.	Within three months of signing	Completed	9
46(h)	New South Wales to develop and implement environmental management systems	Within five years of signing	Forests – Completed ----- DECC – Underway	26
49	New South Wales to report annually to Parliament on compliance with any integrated forestry operations approval for the Eden region and the New South Wales Eden Region Forest Agreement, and to furnish a copy to the Commonwealth	Annually from 1999	Completed	8
52(d)	Both parties to further develop, review, and if necessary revise sustainability indicators	In time for the first five-yearly review	Underway	3
56	New South Wales to produce a code of practice for timber harvesting of native forest on private lands	By the first five-yearly review	Completed	33

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
EDEN RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
86	New South Wales to review legislation and policies relevant to the allocation and pricing of hardwood logs from State forests as part of the Competition Principles Agreement	Before the end of 1999	Concluded	43
87	New South Wales to establish a research liaison committee and publish a list of research priorities	Within 12 months of signing	Concluded	12
89	New South Wales to prepare a compendium of New South Wales forest research	By the first five-yearly review	Up to 2002 – Underway ----- Post-2002 – Concluded	13
92 and 93	New South Wales and the Commonwealth to develop a data agreement and lodge archival copies of data	Within six months of signing	Completed	14
Att 1 point 4	New South Wales to prepare plans of management for Crown reserves	By 1 January 2002	Concluded	19
Att 1 point 7	New South Wales to establish all dedicated reserve and informal reserve components of the CAR reserve system	Within six months of signing	Completed	21
Att 2 table 1	New South Wales to develop recovery plans for species listed in table 1	Within five years of signing	Underway	23
Att 3 point 8	Both parties to finalise statewide guidelines for the management of cultural heritage values and places	End of 1999	Completed	24
Att 5 point 1(p)	New South Wales to publish a State of Parks report	By April 2000	Completed	20
Att 5 point 2(b)	New South Wales to publish the document Ecologically Sustainable Forest Management for the Eden RFA Assessment	Within six months of signing	Completed	32
Att 5 point 2(c)	New South Wales to document the basis for silvicultural practices and publish silvicultural guidelines for commercial forest types	By 31 March 2000	Completed	40
Att 5 point 2(d)	New South Wales to publish the results from the Yambulla and Tantawangalo research catchments	By the year 2000	Yambulla – Underway ----- Tantawangalo – Concluded	15
Att 5 point 2(e)	New South Wales to publish the results from the Eden burning study	By the first five-yearly review	Completed	16
Att 5 point 2(f)	New South Wales to document and publish a description of the NSW forest management system covering public and private lands	In time for the first five-yearly review	Underway	35
Att 5 point 2(g)	New South Wales to publish a description of the FRAMES system referred to in clause 46 (f).	Within three months	Completed	46
Att 5 point 2(h)	New South Wales to publish a description of the methods and results of calculating sustainable yield on public land	By the first five-yearly review	To be done	54
Att 5 point 2(h)	New South Wales to publish independent audits of sustainable yield as outlined in attachment 11	For the second and subsequent five-yearly reviews	Not required until the second five-year review	55
Att 5 point 2(i)	New South Wales to table in each House of Parliament an annual report on the New South Wales Eden Region Forest Agreement in accordance with the <i>Forestry and National Park Estate Act 1998</i> (NSW) which will include an ESFM report and the outcomes of compliance with any integrated forestry operations approval for the region	Annually from 1999	Tabling – Underway	8

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
EDEN RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
Att 7 point 12	New South Wales to incorporate codes of practice that address bush and other fires within regional ESFM plans and plans of management for areas dedicated under the <i>National Parks and Wildlife Act 1974</i> (NSW)	By the first five-yearly review	Completed	27
Att 7 point 13	New South Wales to establishing a process, including public reporting, for regular audits of compliance and reviews of codes of practice, eco-field guides and/ regional prescriptions	By December 2002	Completed	30
Att 7 point 13	New South Wales to undertake audits as described above	By the first and subsequent five-yearly reviews of the agreement	Completed	31
Att 11 point 5	Continuous monitoring of predicted s annual yields		Concluded	51
Att 11 point 1	The parties to commission, complete and publish a review of the systems and processes used, and the sustainable yield calculated from public land as a result of the New South Wales review of sustainable yield described in clause 46 (f)	By the first five-yearly review	Underway	53
Att 11 point 2	New South Wales to undertake, complete and publish independent audits of sustainable yield	In time for the second and subsequent five-yearly review	Not required until the second five-year review	55
Att 11 point 5	New South Wales to establish a continuous FRAMES development program for the Eden region consistent with the statewide FRAMES	By the first five-yearly review	Underway	48

B. North East RFA milestones

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
6	The parties to determine the process for extending the Agreement for a further period	As part of the third five-yearly review	Not applicable	1
33	Commonwealth to use its best endeavours to secure the enactment of legislation which amends the Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)	By 30 June 2000	Completed	17
39	Parties to report annually on the achievement of milestones in this Agreement	Annually for the first five years	Completed	5
42	The parties to determine the mechanism for the five-year review	Before the end of the five-year review period	Completed	2
43	Commonwealth will table the signed RFA in the Commonwealth Parliament	Following Signature	Completed	7
43	Commonwealth will table in the Commonwealth Parliament the annual reports of achievement of milestones for the first four years	Annually	Completed	6
43	Commonwealth will table in the Commonwealth Parliament the first five yearly review on performance against milestones and commitments	Following first five yearly review	Not applicable	4
48(c)	New South Wales to complete and publish plans of management for areas dedicated under the National Parks and Wildlife Act 1974 (NSW)	By 1 January 2005	Underway	18
48(d)	New South Wales to complete and publish regional ESFM plans for State forests	By 30 June 2000	Completed	36
48(e)	New South Wales to implement the Forest Management Zoning system for the Upper North East and Lower North East regions	By 30 June 2000	Completed	37
48(g)	New South Wales to implement the review and monitoring processes and develop the strategic and operational requirements of sustainable yield systems and processes to enable a review of sustainable yield	By 1 December 2006	Review – Completed	53
Develop – Completed			52	
48(h)	New South Wales to develop and implement environmental management systems	Within five years of signing	DECC – Underway	26
Forests NSW – Completed				
51	NSW to report on compliance of the Integrated Forestry Operations Approval for the Upper North East Region and the Integrated Forestry Operations Approval Lower North East Region and furnish the Commonwealth with a copy of these reports	Annually	Reporting – Completed	8
Tabling – Underway				
53(d)	Both parties to further develop, review, and if necessary revise sustainability indicators	In time for the first five-yearly review	Underway	3
57	New South Wales to produce a code of practice for Timber Harvesting of native forest on private lands	By the first five-yearly review	Completed	33
58	NSW to complete code of practice for plantations on private land	31 December 2000	Completed	34
81	NSW to review FRAMES and wood supply	By 1 December 2006	FRAMES – Underway	48
Wood – Completed			56	

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
NORTH EAST RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
83	Changes in contracted volumes following review to be incorporated in this agreement and wood supply agreement holders to be advised	By 1 December 2006	Completed	56
100	New South Wales to establish a research liaison committee and publish a list of research priorities	By August 2000	Concluded	12
102	New South Wales to prepare a compendium of New South Wales forest research	By the first five-yearly review	Up to 2002 – Underway ----- Post 2002 – Concluded	13
105	New South Wales and the Commonwealth to lodge archival copies of data	Within six months of signing	Completed	14
Att 1A & Att 1 B point 4	NSW to prepare plans of management for Crown reserves	By 1 January 2005	Concluded	19
Att 1 A point 5	NSW will finalise boundaries of CAR reserves to enable implementation	Within six months of signing	Completed	21
Att 1A point 8 & Att 1B point 12	New South Wales to establish all dedicated reserve and informal reserve components of the CAR reserve system	Within six months of signing	Completed	21
Att 3 point 4	NSW to complete the threat abatement plan for the European red fox	By July 2000	Completed	22
Att 2 table 1	New South Wales to develop recovery plans for species listed in table 1 of attachment 2	Within five years of signing	Underway	23
Att 6 1(p)	New South Wales to publish a <i>State of Parks</i> report	By April 2001	Completed	20
Att 6 2(b)	NSW will publish of eco-field guides for the Upper North East region and the Lower North East region	By 30 June 2000	Completed	39
Att 6 point 2(c)	New South Wales to publish the Native Forest Silviculture Manual (SFNSW)	By 31 December 2000	Completed	40
Att 6 point 2(d)	New South Wales to document and publish a description of the NSW forest management system covering public and private lands	In time for the first five-yearly review	Underway	35
Att 6 point 2(e)	New South Wales to publish a description of the methods and results of calculating sustainable yield on public land	By 1 December 2006	Completed	54
Att 6 point 2(e)	New South Wales to publish independent audits of sustainable yield as outlined in attachment 12	For the second and subsequent five-yearly reviews	Not required until second five-year review	55
Att 6 point 2(f)	New South Wales to table in each House of Parliament an annual report on the New South Wales Upper North East Regional Forest Agreement and Lower North East Regional Forest Agreement in accordance with the <i>Forestry and National Park Estate Act 1998</i> (NSW) which will include an ESFM report and the outcomes of compliance with any integrated forestry operations approval for the regions	Annually	Underway	8
Att 8 1(a)	NSW NPWS will develop an environmental management system for lands dedicated under the NPW Act	By April 2004	Underway	26
Att 8 1(b)	SFNSW develop a native forest management system as an environmental management system	By April 2001	Completed	26

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
NORTH EAST RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
Att 8 1(l)	New South Wales to incorporate codes of practice that address in an integrated fashion bush and other fires within regional ESFM plans and plans of management for areas dedicated under the <i>National Parks and Wildlife Act 1974</i> (NSW)	By the first five-yearly review	Completed	27
Att 8 1(m)	New South Wales to incorporate within the regional ESFM plans and plans of management under the NPW Act integrated feral animal and weed control programs	By the first five-year review	Completed	28 & 29
Att 8 1(n)	New South Wales to establishing a process, including public reporting, for regular audits of compliance and reviews of codes of practice, eco-field guides and/ regional prescriptions	By December 2002	Completed	30
Att 8 1(n)	New South Wales to undertake audits as described above	By the first and subsequent five-yearly reviews of the agreement	Completed	31
Att 8 1(o)	NSW will establish demonstration areas in both the Upper North East Region and the Lower North East region for illustrating silvicultural practices and the suite of silvicultural regimes practiced	By April 2001	Completed	38
Att 8 1(q)	NSW will develop a model to predict recruitment and maintenance of habitat trees over time	By the end of 2010	Underway but not required until second five-year review	59
Att 8 1 (s)	NSW will publish the native forest silviculture manual (SFNSW)	By 31 December 2000	Completed	40
Att 12 part B 15	State Forests NSW will complete the enhancement of FRAMES, commission and publish an independent review of the enhanced system and review the timber and annual volume to be harvested from 2007–18	By 1 December 2006	FRAMES improvements– Underway ----- Review – Completed ----- Wood/volume – Completed	48 ----- 50 ----- 56
Att 12 part C 19	Subject to availability of suitable land NSW will purchase private lands and/or timber rights to supply high-quality large sawlogs and large veneer logs	By the end 2004	Underway	44
Att 12 part C 19	Subject to availability of suitable land NSW will establish at least 10,000 hectares of hardwood plantations	By the end 2004	Underway	45
Att 12 part D 21 Dot 5	Use best endeavours to undertake an inventory of private forests to determine the basis of yield of wood products	Within five years of signature	Concluded	42
Att 12 part E 22 Dot 4	Report on the annual production of all timber products	Annually	Completed	58
Att 12 part E 22 Dot 5	Undertake additional inventory plot measurement consistent with FRAMES principles to improve the accuracy of volume estimates at the regional level		Underway	49
Att 12 part E 22 Dot 6	Monitor FRAMES through comparison of actual versus predicted volumes	Annually	Concluded	51
Att 12 part E 23	NSW will undertake independent audits of the progress of the sustainable wood supply strategy	To be completed in time for the 2nd and 3rd five-yearly reviews	Not required until second five-year review	55

C. Southern RFA milestones

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
6	The parties to determine the process for extending the agreement for a further period	As part of the third five-yearly review	Not applicable	1
34	NSW will have in place a forest agreement covering the Southern region and grant an integrated forestry operations approval applying to the Southern region	By 30 June 2001	Completed	10
37	Parties to report annually on the achievement of milestones in this agreement	Annually for the first five years	Completed	5
40	The parties to determine the mechanism for the five-year review	Before the end of the five-year review period	Completed	2
41	Commonwealth will table the signed RFA in the Commonwealth Parliament	Following signature	Completed	7
41	Commonwealth will table in the Commonwealth Parliament the annual reports of achievement of milestones for the first four years	Annually	Completed	6
41	Commonwealth will table in the Commonwealth Parliament the first five-yearly review on performance against milestones and commitments	Following first five-yearly review	Not applicable	4
47(c)	New South Wales to complete and publish plans of management for areas dedicated under the <i>National Parks and Wildlife Act 1974</i> (NSW)	By 31 January 2006	Underway	18
47(d)	New South Wales to complete and publish regional ESFM plans for state forests	By 31 December 2001	Completed	36
47(e)	New South Wales to implement the forest management zoning system for the Southern region	By 31 December 2001	Completed	37
47(g)	New South Wales to implement the review and monitoring processes and develop the strategic and operational requirements of sustainable yield systems and processes to enable a review of sustainable yield	By 1 December 2006	Review – Underway ----- Develop – Underway	53 ---- 52
47(h)	New South Wales to develop and implement environmental management systems	By 30 April 2004	DECC – Underway ----- Forests NSW – Completed	26
50	NSW to report on compliance of the integrated forestry operations approval applying to the Southern region and furnish the Commonwealth with a copy of these reports	Annually	Completed	8
52(d)	Both parties to further develop, review, and if necessary revise sustainability indicators	In time for the first five-yearly review	Underway	3
56	New South Wales to produce a code of practice for Timber Harvesting of native forest on private lands	By the first five-yearly review	Completed	33
57	NSW to complete code of practice for plantations on private land	By 30 June 2001	Completed	34
98	New South Wales to establish a research liaison committee and publish a list of research priorities	By 30 September 2001	Concluded	12
100	New South Wales to prepare a compendium of New South Wales forest research	By the first five-yearly review	Up to 2002 – Underway ----- Post 2002 – Concluded	13

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
SOUTHERN RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
103	New South Wales and the Commonwealth to lodge archival copies of data	By 30 June 2001	Completed	14
Att 1 point 4	NSW to prepare plans of management for Crown reserves	By 31 January 2006	Concluded	19
Att 1 point 5	NSW will finalise boundaries of CAR reserve with the exception of the forest management zoning system	By 30 June 2001	Completed	21
Att 1 point 5	NSW will finalise the forest management zoning system	By 31 December 2001	Completed	37
Att 1 point 8	New South Wales to establish all dedicated reserve components of the CAR reserve system	By 30 June 2001	Completed	21
Att 1 point 8	New South Wales to establish all informal reserve components of the CAR reserve system	By 31 December 2001	Completed	21
Att 3 point 4	NSW will complete the threat abatement plan for the European red fox	By 31 December 2001	Completed	22
Att 3 table 1	New South Wales to develop recovery plans for species listed in table 1	Within five years of signing	Underway	23
Att 4 point 14	NSW will identify and assess cultural heritage values in areas excluded from CRA assessments	By 31 December 2001	Concluded	25
Att 6 point 1(o)	New South Wales to publish a <i>State of Parks</i> report	By 31 August 2001	Completed	20
Att 6 point 2(b)	NSW will publish eco-field guides for Southern region	By 31 December 2001	SC – Completed ----- Tumut – Concluded	39
Att 6 point 2(c)	New South Wales to document the basis for silvicultural practices and publish the <i>Native Forest Silviculture Manual</i> (SFNSW)	By 31 March 2001	Completed	40
Att 6 point 2(d)	New South Wales to document and publish a description of the NSW forest management system covering public and private lands	In time for the first five-yearly review	Underway	35
Att 6 point 2(e)	New South Wales to publish a description of the methods and results of calculating sustainable yield on public land	By 1 December 2006	To be done	54
Att 6 point 2(e)	New South Wales to publish independent audits of sustainable yield as outlined in attachment 8	For the second and subsequent five-yearly reviews	Not required until the second five-year review	55
Att 6 point 2(f)	NSW will produce annual reports of progress for meeting targets in regional ESFM plans	Annually	Underway	41
Att 6 point 2(g)	NSW will report on the forest agreement covering the Southern region and on compliance with the IFOA applying to the Southern region	Annually	Completed	8
Att 6 point	New South Wales to table in each House of Parliament an annual report on the New South Wales <i>Southern Region Forest Agreement</i> in accordance with the <i>Forestry and National Park Estate Act 1998</i> (NSW) which will include an ESFM report and the outcomes of compliance with any integrated forestry operations approval for the regions	Annually	Underway	8
Att 8 point 2(b)	NSW NPWS will develop an environmental management system for lands dedicated under the NPW Act	By 30 April 2004	Underway	26

**APPENDIX 1. ITEMS FOR THE REVIEW AND REVIEW CONCLUSION
SOUTHERN RFA MILESTONES**

Clause/ attachment etc	Action	Timeline	Review conclusion	Report milestone number
Att 8 point 2(c)	SFNSW develop a native forest management system as an environmental management system	By 30 April 2001	Completed	26
Att 8 point 2(l)	New South Wales to incorporate provisions that address in an integrated fashion bush and other fires within regional ESFM plans and plans of management for areas dedicated under the NPW Act	By the first five-yearly review	Completed	27
Att 8 point 2(m)	New South Wales to incorporate within the regional ESFM plans and plans of management under the NPW Act 1974 integrated feral animal and weed control programs	By the first five-yearly review.	Completed	28 & 29
Att 8 point 2	New South Wales to establish a process, including public reporting, for regular audits of compliance and reviews of codes of practice, eco-field guides and regional prescriptions	By 31 December 2002	Completed	30
Att 8 point 2(n)	New South Wales to undertake audits as described above	By the first and subsequent five-yearly reviews of the agreement	Completed	31
Att 8 point 5	SFNSW will publish all FRAMES CRA reports for the Southern region	By 30 September 2001	Completed	47
Att 8 point 6(b)	NSW will develop a model to predict recruitment and maintenance of habitat trees	By end 2010	Underway but not required until the second five-year review	59
Att 8 point 6(d)	Report production of all timber products	Annually	Completed	58
Att 8 point 6(e)	Undertake additional FRAMES plot inventory measurements	By the first five yearly review.	Underway	49
Att 8 point 6(f)	Monitor FRAMES performance through comparison of actual versus predicted volumes	Annually	Concluded	51
Att 8 point 7	NSW will establish and implement an ongoing FRAMES development program	By 1 December 2006	Underway	48
Att 8 point 8	NSW agrees to commission and publish an independent review of the enhanced FRAMES systems and processes applying to both the South Coast and Tumut sub-regions	By 1 December 2006	Concluded	50
Att 11 point 7	NSW will have long-term wood supply contracts in place for South Coast and Tumut	By 1 January 2001 and 1 January 2002 respectively	Completed	57

Appendix 2: Management plans

Eden RFA

Name	RFA region*	Status**
Bell Bird Creek Nature Reserve	Eden	2a
Ben Boyd National Park	Eden	1
Bermagui Nature Reserve	Eden	1
Biamanga National Park	Eden	2c
Bondi Gulf Nature Reserve	Eden	1
Bournda National Park	Eden	1
Bournda Nature Reserve	Eden	1
Coolumbooka Nature Reserve	Eden	2a
Dangelong Nature Reserve	Eden	2b
Davidson Whaling Station Historic Site	Eden	1
Eagles Claw Nature Reserve	Eden	1
Egan Peaks Nature Reserve	Eden	1
Mimosa Rocks National Park	Eden	1
Mount Imlay National Park	Eden	1
Nadgee Nature Reserve	Eden	1
South East Forest National Park	Eden	1
Wadbilliga National Park	Eden and Southern	2a
Yurammie State Conservation Area	Eden	2c

* Some reserves are located in more than one region. These reserves are counted as being part of the region in which the largest part of the reserve is located.

** Status: 0 = plan of management not commenced; 1 = plan adopted by the Minister; 2a = draft plan publicly exhibited; 2b = draft plan finalised; 2c = plan in preparation.

North East RFA

Name	RFA region*	Status**
Andrew Johnston Big Scrub Nature Reserve	North East – Upper	1
Appletree Aboriginal Area	North East – Lower	0
Arakoon State Conservation Area	North East – Lower	1
Awabakal Nature Reserve	North East – Lower	0
Baalijin Nature Reserve	North East – Lower	2c
Back River Nature Reserve	North East – Lower	2c
Bago Bluff National Park	North East – Lower	1
Bagul Waajaarr Nature Reserve	North East – Lower	2a
Bald Rock National Park	North East – Upper	1
Ballina Nature Reserve	North East – Upper	1
Bandicoot Island Nature Reserve	North East – Lower	2c
Banyabba Nature Reserve	North East – Upper	2a
Barakee National Park	North East – Lower	2c
Barool National Park	North East – Upper	1
Barrington Tops National Park	North East – Lower	2a
Basket Swamp National Park	North East – Upper	1
Bellinger River National Park	North East – Lower	1
Ben Halls Gap National Park	North East – Lower	1
Berrico Nature Reserve	North East – Lower	0
Billinudgel Nature Reserve	North East – Upper	1
Bindarri National Park	North East – Upper and Lower	2a
Biriwal Bulga National Park	North East – Lower	1
Bluff River Nature Reserve	North East – Upper	2c
Boatharbour Nature Reserve	North East – Upper	1
Bolivia Hill Nature Reserve	North East – Upper	2c
Bollanolla Nature Reserve	North East – Lower	2a
Bongil Bongil National Park	North East – Upper and Lower	1
Boonanghi Nature Reserve	North East – Lower	1
Boonoo Boonoo National Park	North East – Upper	1
Boorganna Nature Reserve	North East – Lower	1
Booroolong Nature Reserve	North East – Lower	1
Booti Booti National Park	North East – Lower	1
Border Ranges National Park	North East – Upper	1
Bouddi National Park	North East – Lower	1
Bowraville Nature Reserve	North East – Lower	2a
Bretti Nature Reserve	North East – Lower	0
Brimbin Nature Reserve	North East – Lower	1
Brisbane Water National Park	North East – Lower	1
Broadwater National Park	North East – Upper	1
Broken Head Nature Reserve	North East – Upper	1
Brunswick Heads Nature Reserve	North East – Upper	1
Bugan Nature Reserve	North East – Lower	2c

Name	RFA region*	Status**
Bundjalung National Park	North East – Upper	1
Bungabbee Nature Reserve	North East – Upper	1
Bungawalbin National Park	North East – Upper	2c
Bungawalbin Nature Reserve	North East – Upper	2c
Burning Mountain Nature Reserve	North East – Lower	1
Burnt-Down Scrub Nature Reserve	North East – Upper	2a
Butterleaf National Park	North East – Upper	2c
Byrnes Scrub Nature Reserve	North East – Upper	1
Camels Hump Nature Reserve	North East – Lower	0
Camerons Gorge Nature Reserve	North East – Lower	2b
Cape Byron State Conservation Area	North East – Upper	1
Capoompeta National Park	North East – Upper	1
Captains Creek Nature Reserve	North East – Upper	2a
Carrai National Park	North East – Lower	2a
Cascade National Park	North East – Lower and Upper	2b
Cathedral Rock National Park	North East – Upper and Lower	1
Cedar Brush Nature Reserve	North East – Lower	1
Chaelundi National Park	North East – Upper	2a
Chambigne Nature Reserve	North East – Upper	1
Chapmans Peak Nature Reserve	North East – Upper	2a
Clarence Estuary Nature Reserve	North East – Upper	2a
Clybucca Historic Site	North East – Lower	1
Cockle Bay Nature Reserve	North East – Lower	2a
Columbey National Park	North East – Lower	0
Coocumbac Island Nature Reserve	North East – Lower	1
Coolongolook Nature Reserve	North East – Lower	0
Cooperabung Creek Nature Reserve	North East – Lower	1
Coorabakh National Park	North East – Lower	1
Coramba Nature Reserve	North East – Upper	2a
Corrie Island Nature Reserve	North East – Lower	0
Cottan-Bimbang National Park	North East – Lower	2c
Couchy Creek Nature Reserve	North East – Upper	0
Coxcomb Nature Reserve	North East – Lower	2b
Crowdy Bay National Park	North East – Lower	1
Cudgen Nature Reserve	North East – Upper	1
Cumbebin Swamp Nature Reserve	North East – Upper	2c
Cunnawarra National Park	North East – Lower	1
Darawank Nature Reserve	North East – Lower	0
Davis Scrub Nature Reserve	North East – Upper	1
Deer Vale Nature Reserve	North East – Lower	2a
Demon Nature Reserve	North East – Upper	1
Dharug National Park	North East – Lower	1
Doctors Nose Mountain Nature Reserve	North East – Upper	0
Dooragan National Park	North East – Lower	1

Name	RFA region*	Status**
Dorrigo National Park	North East – Lower and Upper	1
Dunggir National Park	North East – Lower	1
Duval Nature Reserve	North East – Lower	1
Fifes Knob Nature Reserve	North East – Lower	1
Finchley Aboriginal Area	North East – Lower	2a
Fishermans Bend Nature Reserve	North East – Lower	1
Flaggy Creek Nature Reserve	North East – Upper	1
Fortis Creek National Park	North East – Upper	2a
Gads Sugarloaf Nature Reserve	North East – Lower	1
Ganay Nature Reserve	North East – Lower	2a
Georges Creek Nature Reserve	North East – Lower	1
Ghin-Doo-Ee National Park	North East – Lower	0
Gibraltar Nature Reserve	North East – Upper	2b
Gibraltar Range National Park	North East – Upper	1
Gir-um-bit National Park	North East – Lower	0
Gir-um-bit State Conservation Area	North East – Lower	0
Glenrock State Conservation Area	North East – Lower	1
Goonengerry National Park	North East – Upper	1
Goonook Nature Reserve	North East – Lower	2b
Goulburn River National Park	North East – Lower	1
Gumbaynggirr National Park	North East – Lower	0
Guy Fawkes River National Park	North East – Upper	2a
Guy Fawkes River Nature Reserve	North East – Upper	2a
Hat Head National Park	North East – Lower	1
Hattons Bluff Nature Reserve	North East – Upper	0
Hayters Hill Nature Reserve	North East – Upper	1
Hogarth Range Nature Reserve	North East – Upper	1
Hortons Creek Nature Reserve	North East – Upper	1
Howe Aboriginal Area	North East – Lower	0
Hunter Estuary National Park	North East – Lower	1
Iluka Nature Reserve	North East – Upper	1
Imbota Nature Reserve	North East – Lower	1
Indwarra National Park	North East – Upper	1
Inner Pocket Nature Reserve	North East – Upper	0
Jaaningga Nature Reserve	North East – Lower	2a
Jagun Nature Reserve	North East – Lower	2a
Jasper Nature Reserve	North East – Lower	1
Jobs Mountain Nature Reserve	North East – Lower	0
Junuy Juluum National Park	North East – Lower	2b
Juugawaarri Nature Reserve	North East – Lower	2a
Karuah National Park	North East – Lower	2c
Karuah Nature Reserve	North East – Lower	2c
Kattang Nature Reserve	North East – Lower	1
Khappinghat Nature Reserve	North East – Lower	2c

Name	RFA region*	Status**
Khatambuhl Nature Reserve	North East – Lower	2c
Killabakh Nature Reserve	North East – Lower	2b
Killarney Nature Reserve	North East – Lower	1
Koorebang Nature Reserve	North East – Lower	1
Koreelah National Park	North East – Upper	2c
Kororo Nature Reserve	North East – Upper	2a
Koukandowie Nature Reserve	North East – Upper	1
Kumbatine National Park	North East – Lower	2a
Ku-ring-gai Chase National Park	North East – Lower	1
Lake Innes Nature Reserve	North East – Lower	1
Lake Macquarie State Conservation Area	North East – Lower	1
Lansdowne Nature Reserve	North East – Lower	0
Lennox Head Aboriginal Area	North East – Upper	1
Limeburners Creek Nature Reserve	North East – Lower	1
Limpinwood Nature Reserve	North East – Upper	1
Lion Island Nature Reserve	North East – Lower	1
Little Llangothlin Nature Reserve	North East – Upper	1
Little Pimlico Island Nature Reserve	North East – Upper	2a
Macquarie Nature Reserve	North East – Lower	2a
Mallanganee National Park	North East – Upper	1
Mann River Nature Reserve	North East – Upper	2a
Manobalai Nature Reserve	North East – Lower	2b
Maria National Park	North East – Lower	1
Marshalls Creek Nature Reserve	North East – Upper	2a
Maryland National Park	North East – Upper	1
Mebbin National Park	North East – Upper	1
Medowie Nature Reserve	North East – Lower	0
Mernot Nature Reserve	North East – Lower	0
Middle Brother National Park	North East – Lower	1
Mills Island Nature Reserve	North East – Lower	2c
Moffats Swamp Nature Reserve	North East – Lower	0
Monkerai Nature Reserve	North East – Lower	2a
Monkeycot Nature Reserve	North East – Lower	0
Mooball National Park	North East – Upper	2b
Moonee Beach Nature Reserve	North East – Upper	2b
Mooney Mooney Aboriginal Area	North East – Lower	0
Moore Park Nature Reserve	North East – Upper	0
Mororo Creek Nature Reserve	North East – Upper	2b
Mother Of Ducks Lagoon Nature Reserve	North East – Upper	2c
Mount Clunie National Park	North East – Upper	2c
Mount Hyland State Conservation Area	North East – Upper	2a
Mount Jerusalem National Park	North East – Upper	1
Mount Mackenzie Nature Reserve	North East – Upper	2c
Mount Neville Nature Reserve	North East – Upper	2a

Name	RFA region*	Status**
Mount Nothofagus National Park	North East – Upper	2c
Mount Nullum Nature Reserve	North East – Upper	0
Mount Pikapene National Park	North East – Upper	2a
Mount Royal National Park	North East – Lower	2a
Mount Seaview Nature Reserve	North East – Lower	1
Mount Warning National Park	North East – Upper	1
Mount Yarrowyck Nature Reserve	North East – Lower	2c
Muckleewee Mountain Nature Reserve	North East – Upper	1
Muldiva Nature Reserve	North East – Lower	2a
Mummel Gulf National Park	North East – Lower	2c
Munmorah State Conservation Area	North East – Lower	1
Munro Island Nature Reserve	North East – Upper	2a
Muttonbird Island Nature Reserve	North East – Upper	2a
Myall Lakes National Park	North East – Lower	1
Nambucca Aboriginal Area	North East – Lower	0
New England National Park	North East – Lower and Upper	1
Ngambaa Nature Reserve	North East – Lower	1
Ngulin Nature Reserve	North East – Lower	2c
Nightcap National Park	North East – Upper	1
North Obelisk Nature Reserve	North East – Upper	0
Nowendoc National Park	North East – Lower	2c
Numinbah Nature Reserve	North East – Upper	1
Nunguu Mirral Aboriginal Area	North East – Lower	0
Nymboi-Binderay National Park	North East – Upper and Lower	2c
Nymboida National Park	North East – Upper	1
Oxley Wild Rivers National Park	North East – Lower	1
Pambalong Nature Reserve	North East – Lower	1
Parr State Conservation Area	North East – Lower	2a
Pee Dee Nature Reserve	North East – Lower	1
Pelican Island Nature Reserve	North East – Lower	2a
Popran National Park	North East – Lower	1
Pulbah Island Nature Reserve	North East – Lower	1
Queens Lake Nature Reserve	North East – Lower	2c
Ramornie National Park	North East – Upper	2c
Rawdon Creek Nature Reserve	North East – Lower	1
Regatta Island Nature Reserve	North East – Lower	2b
Richmond Range National Park	North East – Upper	1
Richmond River Nature Reserve	North East – Upper	1
Rileys Island Nature Reserve	North East – Lower	2a
Sea Acres Nature Reserve	North East – Lower	1
Seaham Swamp Nature Reserve	North East – Lower	2a
Serpentine Nature Reserve	North East – Lower	2b
Sherwood Nature Reserve	North East – Upper	2a
Single National Park	North East – Upper	2c

Name	RFA region*	Status**
Skillion Nature Reserve	North East – Lower	1
Snapper Island Nature Reserve	North East – Lower	0
Snows Gully Nature Reserve	North East – Upper	1
Spectacle Island Nature Reserve	North East – Lower	1
Stonewoman Aboriginal Area	North East – Upper	0
Stony Batter Creek Nature Reserve	North East – Lower	1
Stotts Island Nature Reserve	North East – Upper	1
Sugarloaf State Conservation Area	North East – Lower	0
Susan Island Nature Reserve	North East – Upper	2b
Tabbimoble Swamp Nature Reserve	North East – Upper	2c
Talawahl Nature Reserve	North East – Lower	2c
Tallawudjah Nature Reserve	North East – Upper	1
Tapin Tops National Park	North East – Lower	1
The Basin Nature Reserve	North East – Upper	1
The Castles Nature Reserve	North East – Lower	1
The Glen Nature Reserve	North East – Lower	2c
Tilligerry National Park	North East – Lower	0
Tilligerry Nature Reserve	North East – Lower	0
Tilligerry State Conservation Area	North East – Lower	0
Tingira Heights Nature Reserve	North East – Lower	2a
Tomalla Nature Reserve	North East – Lower	2c
Tomaree National Park	North East – Lower	1
Tooloom National Park	North East – Upper	1
Toonumbar National Park	North East – Upper	1
Torrington State Conservation Area	North East – Upper	1
Towarri National Park	North East – Lower	1
Towibakh Nature Reserve	North East – Lower	0
Tuckean Nature Reserve	North East – Upper	1
Tucki Tucki Nature Reserve	North East – Upper	2a
Tuggolo Creek Nature Reserve	North East – Lower	2c
Tweed Estuary Nature Reserve	North East – Upper	2a
Tweed Heads Historic Site	North East – Upper	1
Tyagarah Nature Reserve	North East – Upper	1
Ukerebagh Nature Reserve	North East – Upper	1
Ulidarra National Park	North East – Upper	2c
Uralba Nature Reserve	North East – Upper	1
Valla Nature Reserve	North East – Lower	2a
Victoria Park Nature Reserve	North East – Upper	1
Wallamba Nature Reserve	North East – Lower	2c
Wallaroo National Park	North East – Lower	2c
Wallingat National Park	North East – Lower	2a
Wallis Island Nature Reserve	North East – Lower	0
Wamberal Lagoon Nature Reserve	North East – Lower	1
Wambina Nature Reserve	North East – Lower	1

Name	RFA region*	Status**
Warra National Park	North East – Upper	1
Warragai Creek Nature Reserve	North East – Upper	2b
Washpool National Park	North East – Upper	1
Watagans National Park	North East – Lower	2b
Weelah Nature Reserve	North East – Lower	1
Werakata National Park	North East – Lower	0
Werakata State Conservation Area	North East – Lower	0
Werrikimbe National Park	North East – Lower	1
Willi Willi Caves Nature Reserve	North East – Lower	1
Willi Willi National Park	North East – Lower	2b
Wilson Nature Reserve	North East – Upper	1
Wingen Maid Nature Reserve	North East – Lower	1
Wingham Brush Nature Reserve	North East – Lower	1
Woko National Park	North East – Lower	0
Wollemi National Park	North East – Lower	1
Woodford Island Nature Reserve	North East – Upper	2b
Wooyung Nature Reserve	North East – Upper	1
Wyrabalong National Park	North East – Lower	1
Yabbra National Park	North East – Upper	2b
Yahoo Island Nature Reserve	North East – Lower	2c
Yarravel Nature Reserve	North East – Lower	1
Yengo National Park	North East – Lower	2a
Yessabah Nature Reserve	North East – Lower	1
Yina Nature Reserve	North East – Lower	1
Yuraygir National Park	North East – Upper	1

* Some reserves are located in more than one region. These reserves are counted as being part of the region in which the largest part of the reserve is located.

** Status: 0 = plan of management not commenced; 1 = plan adopted by the Minister; 2a = draft plan publicly exhibited; 2b = draft plan finalised; 2c = plan in preparation.

Southern RFA

Name	RFA region*	Status**
Araluen Nature Reserve	Southern	2a
Badja Swamps Nature Reserve	Southern	2a
Bamarang Nature Reserve	Southern	2c
Bangadilly National Park	Southern	2a
Barnunj State Conservation Area	Southern	2a
Barren Grounds Nature Reserve	Southern	1
Barrengarry Nature Reserve	Southern	2a
Bees Nest Nature Reserve	Southern	2b
Benambra National Park	Southern	1
Berlang State Conservation Area	Southern	0
Bimberamala National Park	Southern	1
Bimberi Nature Reserve	Southern	1
Binjura Nature Reserve	Southern	2c
Black Andrew Nature Reserve	Southern	1
Bobundara Nature Reserve	Southern	2a
Bogandyera Nature Reserve	Southern	1
Brindabella National Park	Southern	2a
Brindabella State Conservation Area	Southern	2a
Broulee Island Nature Reserve	Southern	2a
Brundee Swamp Nature Reserve	Southern	2a
Budawang National Park	Southern	1
Budderoo National Park	Southern	1
Bugong National Park	Southern	2c
Bungonia State Conservation Area	Southern	1
Burnt School Nature Reserve	Southern	1
Burra Creek Nature Reserve	Southern	2a
Burrinjuck Nature Reserve	Southern	2b
Cambewarra Range Nature Reserve	Southern	2a
Clarkes Hill Nature Reserve	Southern	1
Clyde River National Park	Southern	2c
Colymea State Conservation Area	Southern	2c
Comerong Island Nature Reserve	Southern	1
Conjola National Park	Southern	2a
Coornartha Nature Reserve	Southern	2b
Corramy State Conservation Area	Southern	2a
Courabyra Nature Reserve	Southern	1
Cullendulla Creek Nature Reserve	Southern	1
Cuumbeun Nature Reserve	Southern	1
Deua National Park	Southern	2a
Downfall Nature Reserve	Southern	1
Ellerslie Nature Reserve	Southern	2b
Eurobodalla National Park	Southern	1

Name	RFA region*	Status**
Frogs Hole State Conservation Area	Southern	0
Good Good Nature Reserve	Southern	2b
Goorooyarro Nature Reserve	Southern	0
Gourock National Park	Southern	2a
Gulaga National Park	Southern and Eden	2c
Hattons Corner Nature Reserve	Southern	1
Illawong Nature Reserve	Southern	2a
Ironmungy Nature Reserve	Southern	2a
Jerralong Nature Reserve	Southern	2b
Jerrawangala National Park	Southern	2a
Jervis Bay National Park	Southern	2a
Jingellic Nature Reserve	Southern	1
Joadja Nature Reserve	Southern	2c
Kangaroo River Nature Reserve	Southern	2a
Kooraban National Park	Southern	2a
Kosciuszko National Park	Southern	1
Kybeyan Nature Reserve	Southern	2b
Kybeyan State Conservation Area	Southern and Eden	2b
Livingstone National Park	Southern	2a
Livingstone State Conservation Area	Southern	2a
Macanally State Conservation Area	Southern	2b
Macquarie Pass National Park	Southern	1
Macquarie Pass State Conservation Area	Southern	0
Majors Creek State Conservation Area	Southern	0
Meringo Nature Reserve	Southern	2a
Meroo National Park	Southern	2a
Merriangaah Nature Reserve	Southern	2a
Minjary National Park	Southern	1
Monga National Park	Southern	2a
Monga State Conservation Area	Southern	0
Morton National Park	Southern	1
Morton State Conservation Area	Southern	2c
Mount Clifford Nature Reserve	Southern	2b
Mount Dowling Nature Reserve	Southern	1
Mudjarn Nature Reserve	Southern	2a
Mullengandra Nature Reserve	Southern	2a
Murramarang Aboriginal Area	Southern	1
Murramarang National Park	Southern	1
Myalla Nature Reserve	Southern	2a
Narrawallee Creek Nature Reserve	Southern	1
Nest Hill Nature Reserve	Southern	1
Ngadang Nature Reserve	Southern	2a
Nimmo Nature Reserve	Southern	2a
Numeralla Nature Reserve	Southern	2b

Name	RFA region*	Status**
Oak Creek Nature Reserve	Southern	2a
Parma Creek Nature Reserve	Southern	2a
Paupong Nature Reserve	Southern	2a
Queanbeyan Nature Reserve	Southern	1
Quidong Nature Reserve	Southern	2a
Robertson Nature Reserve	Southern	1
Rodway Nature Reserve	Southern	2a
Saltwater Swamp Nature Reserve	Southern	2a
Scabby Range Nature Reserve	Southern	2a
Scott Nature Reserve	Southern	2a
Seven Mile Beach National Park	Southern	1
Stony Creek Nature Reserve	Southern	1
Strike-a-Light Nature Reserve	Southern	1
Tallaganda National Park	Southern	2b
Tallaganda State Conservation Area	Southern	2b
Tapitallee Nature Reserve	Southern	0
Tinderry Nature Reserve	Southern	1
Triplarina Nature Reserve	Southern	2c
Tumblong State Conservation Area	Southern	2a
Undoo Nature Reserve	Southern	2b
Wadjan Nature Reserve	Southern and Eden	2b
Wanna Wanna Nature Reserve	Southern	1
Wee Jasper Nature Reserve	Southern	2a
Wereboldera State Conservation Area	Southern	2a
Wogamia Nature Reserve	Southern	2c
Woollamia Nature Reserve	Southern	2a
Woomargama National Park	Southern	2a
Worrigee Nature Reserve	Southern	2c
Wullwe Nature Reserve	Southern	2a
Yanununbeyan National Park	Southern	1
Yanununbeyan Nature Reserve	Southern	1
Yanununbeyan State Conservation Area	Southern	1
Yaouk Nature Reserve	Southern	2a
Yattheyattah Nature Reserve	Southern	1

* Some reserves are located in more than one region. These reserves are counted as being part of the region in which the largest part of the reserve is located.

** Status: 0 = plan of management not commenced; 1 = plan adopted by the Minister; 2a = draft plan publicly exhibited; 2b = draft plan finalised; 2c = plan in preparation.

Appendix 3: Recovery plans

Priority species for preparation of recovery plans in the Eden region (over next five years).

Scientific name	Common name	NSW status	National status	Completion date in Eden RFA	National recovery plan status	NSW recovery plan status – see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Potorous longipes</i>	long-footed potoroo	Endangered	Endangered	NSW plan by June 1999, National plan June 1999	Plan (by Vic) in place adopted 09/03/01, revised plan in prep (by Vic) – contracted 2002/03	3. 30-May-02	Y	N
<i>Isoodon obesulus</i>	southern brown bandicoot	Endangered	Endangered	NSW plan by Dec 1999	Plan in prep (by Vic) – contracted 2002/03	3. 01-Nov-06	Y	N
<i>Pseudomys fumeus</i>	smoky mouse	Endangered	Endangered	NSW plan by Dec 1999	Plan in prep (by Vic) – contracted 2001/02, ready for adoption	1.	Y	N
<i>Phascolarctos cinereus</i>	koala (SE NSW population)	Vulnerable		NSW plan by Dec 2000		2.	Y	N
<i>Mixophyes balbus</i>	stuttering barred frog	Endangered	Endangered	NSW plan by Dec 1999	Plan in prep (by Vic) – contracted 2002/03	1	Y	N
<i>Heleioporus australiacus</i>	giant burrowing frog	Vulnerable	Vulnerable	NSW plan by Dec 2002	Plan in prep (by NSW) – contracted 2003/04	1.	Y	Y
<i>Dasyurus maculatus</i>	tiger quoll	Vulnerable	Vulnerable	NSW plan by June 2001, National plan July 2002	Plan in prep (by Vic) – covering subspecies maculatus and gracilis - contracted 2002/03	5	Y	N
<i>Lathamus discolor</i>	swift parrot	Vulnerable	Vulnerable	National plan complete, NSW plan by Dec 1999	Plan (by Tas) in place, adopted 26/03/02, revised plan in prep (by NSW)	1.	Y	N
<i>Ninox strenua</i> , <i>Tyto novaehollandiae</i> , <i>Tyto tenebricosa</i>	large forest owls: powerful owl, masked owl, sooty owl	Vulnerable		NSW plan by June 2000		3. 01-Oct-06	Y	N
<i>Xanthomyza phrygia</i>	regent honeyeater	Endangered	Endangered	National plan complete, NSW plan by Dec 2000	Plan (by Vic) in place adopted 16/07/00, revised plan in prep (by NSW) - contracted 2002/03	2.	Y	N
<i>Acacia constablei</i>	Constables wattle	Vulnerable	Vulnerable	National/NSW plan by Dec 1999	Plan in prep (by NSW)	3 31/01/2003 (Threatened flora of rocky outcrops)	Y	N

Scientific name	Common name	NSW status	National status	Completion date in Eden RFA	National recovery plan status	NSW recovery plan status – see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Acacia georgensis</i>	Dr. George's wattle	Vulnerable	Vulnerable	National/NSW plan by Dec 1999	Plan in prep (by NSW)	2. 31/01/2003 (Threatened flora of rocky outcrops)	Y	N
<i>Eucalyptus imlayensis</i>	Imlay mallee	Endangered	Vulnerable	National/NSW plan by Dec 1999	No plan commenced	1.	Y	N
<i>Eucalyptus parvula</i>	small-leaved gum	Vulnerable	Vulnerable	National/NSW plan by Dec 2000	No plan commenced	5	Y	N
<i>Genoplesium rhyoliticum</i>	rhyolite midge orchid	Endangered	Endangered	National/NSW plan by Dec 1999	Plan in prep (by NSW)	2. 31/01/2003 (Threatened flora of rocky outcrops)	Y	N
<i>Monotoca rotundifolia</i>	trailing monotoca	Endangered		NSW plan by Dec 2001		5	Y	N
<i>Phebalium</i> (now <i>Leionema</i>) <i>ralstonii</i>	Ralston's phebalium	Vulnerable	Vulnerable	National/NSW plan by Dec 1999	Plan in prep (by NSW)	2. 31/01/2003 (Threatened flora of rocky outcrops)	Y	N
<i>Pomaderris cotoneaster</i>		Endangered	Endangered	National/NSW plan by Dec 2000	Plan in prep (by NSW) - contracted 2002/03	1.	Y	N
<i>Pomaderris elachophylla</i>	lacy pomaderris	Endangered		NSW plan by Dec 2000		1.	Y	N
<i>Viola cleistogamoides</i>	hidden violet	Endangered		NSW plan by June 1999		5	Y	N
<i>Westringia davidii</i>		Vulnerable	Vulnerable	National/NSW plan by Dec 1999	Plan in prep (by NSW)	2. 31/01/2003 (Threatened flora of rocky outcrops)	Y	N
<i>Zieria buxijugum</i>	box zieria	Endangered	Endangered	National/NSW plan by Dec 1999	Plan (by NSW) in place, adopted 18/8/04	3. 22-Mar-02 (Zieria Multispecies Plan)	Y	N
<i>Zieria formosa</i>	shapely zieria	Endangered	Endangered	National/NSW plan by Dec 1999	Plan (by NSW) in place, adopted 18/08/04	3. 22-Mar-02 (Zieria multispecies plan)	Y	N

Scientific name	Common name	NSW status	National status	Completion date in Eden RFA	National recovery plan status	NSW recovery plan status – see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Zieria parrisiae</i>	Parris' zieria	Endangered	Endangered	National/NSW plan by Dec 1999	Plan (by NSW) in place, adopted 18/08/04	3. 22-Mar-02 (Zieria multispecies plan)	Y	N

Key for recovery plan status: 1 = initial planning/in preparation; 2 = draft complete or exhibited; 3 = plan approved (date); 4 = not started; 5 = replaced by PAS

Priority species for preparation of recovery plans in North East RFA (over next five years).

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Acacia baueri baueri</i>			Vulnerable	National plan by July 2005			N	N
<i>Acacia bynoeana</i>		Endangered	Vulnerable	National plan by July 2005	Plan in prep (by NSW) - contracted 2005–06	1	Y	Y
<i>Acacia courtii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Acacia macnuttiana</i>		Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	No plan commenced	5	Y	N
<i>Acacia pubifolia</i>		Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	No plan commenced	5	Y	N
<i>Acacia pycnostachya</i>		Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by NSW)	5	Y	N
<i>Acacia ruppii</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1 (Threatened Flora Species of the Coaldale Sandstone Area)	Y	N
<i>Acronychia littoralis</i>	scented acronychia	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	2.	Y	N
<i>Allocasuarina defungens</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Allocasuarina simulans</i>			Vulnerable	National plan by July 2005	No plan commenced		N	N
<i>Almaleea cambagei</i>		Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	No plan commenced	5	Y	N
<i>Amyema scandens</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Angophora robur</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Arthraxon hispidus</i>			Vulnerable	National plan by July 2005	No plan commenced		N	N
<i>Asperula asthenes</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Austromyrtus fragrantissima</i>	sweet myrtle; small leaved myrtle	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1.	Y	N
<i>Baloghia marmorata</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Bertya ingramii</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Boronia granitica</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 20/02/04	3. 05-Aug-02	Y	N
<i>Bosistoa selwynii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Bosistoa transversa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Bothriochloa biloba</i>			Vulnerable	National plan by July 2005	No plan commenced		N	N
<i>Bulbophyllum globuliforme</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Burhinus grallarius</i>	bush stone-curlew	Endangered		NPWS plan by January 2005		3. 02-Mar-06	Y	N
<i>Cadellia pentastylis</i>	ooline	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Callitris oblonga</i>	pigmy cypress-pine	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	1	Y	N
<i>Caretta caretta</i>	loggerhead turtle	Endangered	Endangered	National plan by July 2003	Plan in place, adopted 29/07/03	5	Y	N
<i>Chelonia mydas</i>	green turtle	Vulnerable	Vulnerable	National plan by July 2005	Plan in place, adopted 29/07/03	5	Y	N
<i>Clematis lawcettii</i>	northern clematis	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Corchorus cunninghamii</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW) - contracted 2003/04	1	Y	Y
<i>Corokia whiteana</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Cryptocarya foetida</i>	stinking cryptocarya	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's double-eyed fig parrot	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by Qld) in place, adopted 13/01/03	3. 04-Sep-02	Y	N
<i>Cynanchum elegans</i>	white-flowered wax plant	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Dasyornis brachypterus</i>	eastern bristlebird	Endangered	Endangered	National plan by July 2003	Plan in prep (by NSW) – completion pending clarification of genetics to enable decision on whether separate plan by Qld for northern population should be combined with this one.	1.	Y	Y
<i>Dasyurus viverrinus</i>	eastern quoll	Endangered		NPWS plan by January 2005		5	Y	N
<i>Davidsonia pruriens</i> var. <i>jerseyana</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 18/08/05	3. 04-Mar-05	Y	N
<i>Davidsonia</i> sp. A Mullumbimby-Currumbin Ck	Davidson's plum	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 10/11/06	3	Y	N
<i>Dermochelys coriacea</i>	leathery turtle	Vulnerable	Vulnerable	National plan by July 2005	Plan in place, adopted 29/07/03	5	Y	N
<i>Desmodium acanthocladum</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Dichanthium setosum</i>			Vulnerable	National plan by July 2005	No plan commenced		N	N
<i>Dichelachne parva</i>				National plan by July 2005			N	N
<i>Digitaria porrecta</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Diomedea exulans</i>	wandering albatross	Endangered	Vulnerable	National plan by July 2005	Plan in place, adopted 01/10/01	5	Y	N
<i>Diospyros mabacea</i>	red-fruited ebony; silky persimmon	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	2.	Y	N
<i>Diploglottis campbellii</i>	small-leaved tamarind	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	3. 26-Jan-06	Y	N
<i>Diuris pedunculata</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by Vic) – contracted 2005–06	5	Y	N
<i>Diuris venosa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Elaeocarpus</i> sp. Rocky Creek		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 20/02/04	3. 30-Jan-03	Y	N
<i>Elaeocarpus williamsianus</i>	hairy quandong	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	2. 26-May-04	Y	N
<i>Emydura signata</i>	Bellinger river emydura		Vulnerable	National plan by July 2005	Plan (by NSW) in place, adopted 20/02/04	3	Y	N
<i>Endiandra floydii</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	3. 26-Jan-06	Y	N
<i>Endiandra hayesii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	3. 26-Jan-06 (Green-leaved Rose Walnut and Rusty Rose Walnut)	Y	N
<i>Eriocaulon australasicum</i>		Endangered	Vulnerable	National plan by July 2005	Plan in prep (by Vic) – contracted 2002–03	5	Y	N
<i>Eriostemon ericifolius</i>			Vulnerable	National plan by July 2005	No plan commenced		N	N
<i>Erythranthera pumila</i>			Vulnerable	National plan by July 2005	Plan (by NSW) in place, adopted 26/03/02		N	N
<i>Erythrorchis radiatus</i>	red goshawk	Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	Plan in prep (by Qld) – contracted 2002–03	3. 28-Oct-02	Y	N
<i>Eubalaena australis</i>	southern right whale	Vulnerable	Endangered	National plan by July 2003	Plan in place, adopted 10/05/05	3. 26-Jan-06	Y	N
<i>Eucalyptus caleyi ovoides</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus camfieldii</i>	Camfield's stringybark	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus glaucina</i>	blue gum var.	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus infera</i>			Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Eucalyptus mckieana</i>	McKie's stringybark	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus nicholii</i>	black peppermint	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Eucalyptus pachycalyx</i>	shiny-barked gum	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1. (Threatened Flora Species of the Coaldale Sandstone Area)	Y	N
<i>Eucalyptus parramattensis decadens</i>		Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by NSW) – contracted 2005–06	1.	Y	N
<i>Eucalyptus pumila</i>	Polkolbin mallee	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus scoparia</i>	Wallangarra white gum	Endangered	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Eucalyptus tetrapleura</i>	square-fruited ironbark	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Euphrasia bella</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Euphrasia collina subsp. muelleri</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by Vic) in place, adopted 22/12/06	5	Y	N
<i>Floydia praealta</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Fontainea australis</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Fontainea oraria</i>	coastal fontainea	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	2. 09-Feb-05	Y	Y
<i>Gentiana wissmannii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Gingidia montana</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	
<i>Grevillea beadleana</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 11/04/05	3. 13-Jul-04	Y	
<i>Grevillea guthrieana</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1.	Y	
<i>Grevillea masonii</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1.	Y	
<i>Grevillea mollis</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	
<i>Grevillea obtusiflora</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 20/02/04	3	Y	N
<i>Grevillea shiressii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Hakea pulvinifera</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 09/03/01	3	Y	N
<i>Hakea</i> sp. <i>B Kowmung River</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Haloragis exalata velutina</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Hicksbeachia pinnatifolia</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Homoranthus darwinioides</i>			Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Hoplocephalus bungaroides</i>	broad headed snake	Endangered	Vulnerable	National plan by July 2005	Plan in prep (by NSW) - contracted 2003–04	1.	Y	N
<i>Hydrocharis dubia</i>			Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Isoglossa eranthemoides</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1.	Y	N
<i>Kennedia retrorsa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	1.	Y	N
<i>Kunzea rupestris</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Lasiopetalum longistamineum</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Lathamus discolor</i>	swift parrot	Endangered	Vulnerable	National plan by July 2005	Plan (by Tas) in place, adopted 26/03/02, revised plan in prep (by NSW)	1.	Y	N
<i>Lepidium hyssopifolium</i>		Endangered	Endangered	National plan by July 2003	Plan in prep (by Vic) - contracted 2002–03	5	Y	N
<i>Leucopogon confertus</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Litoria aurea</i>	green and golden bell frog	Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	Plan in prep (by NSW)	2. 21-Feb-05	Y	N
<i>Litoria booroolongensis</i>	booroolong frog	Endangered	-	NPWS plan by January 2005	Commencement of plan pending	2.	Y	N
<i>Litoria castanea</i>	yellow spotted bell frog	Endangered	-	NPWS plan by January 2005	Plan (by NSW) in place, adopted 20/02/04	3. 27-Jun-01	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Litoria piperata</i>	peppered frog	Vulnerable		NPWS plan by January 2005	Plan (by NSW) in place, adopted 20/02/04	3. 27-Jun-01	Y	N
<i>Macadamia tetraphylla</i>		Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by Qld)	5	Y	N
<i>Macrozamia occidua</i>			Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Melichrus hirsutus</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	1.	Y	N
<i>Mixophyes balbus</i>	stuttering frog	Vulnerable		NPWS plan by January 2005	Plan in prep (by Vic) – contracted 2002–03	1	Y	N
<i>Mixophyes fleayi</i>	Fleay's frog	Vulnerable		NPWS plan by January 2005	Plan in prep (by NSW)	1.	Y	N
<i>Mixophyes iteratus</i>	giant barred frog	Endangered		NPWS plan by January 2005	Plan in prep (by NSW)	1	Y	N
<i>Neoastelia spectabilis</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Ochrosia moorei</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	3. 26-Jan-06	Y	N
<i>Olearia cordata</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Olearia flocktoniae</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW) - contracted 1998/99	2. 09-Feb-05	Y	Y
<i>Owenia cepiodora</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	2.	Y	N
<i>Parsonsia dorrigoensis</i>		Vulnerable	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Persoonia acerosa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	1.	Y	N
<i>Petalura gigantea</i>	giant dragonfly	Endangered		NPWS plan by January 2005		5	Y	N
<i>Petrogale penicillata</i>	brush-tailed rock wallaby	Endangered	Vulnerable	National plan by July 2005	Plan in prep (by Vic) - contracted 2002–03	2. 22-Aug-05	Y	N
<i>Phaius australis</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	4	1. (Swamp Orchids)	Y	N
<i>Phaius tancarvilleae</i>	swamp lily; swamp orchid	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	1. (Swamp Orchids)	Y	N
<i>Phebalium elatius beckleri</i>				National plan by July 2003		5	N	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Pimelea venosa</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Plectranthus nitidus</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N
<i>Poephila cincta</i>	black-throated finch	Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	Plan (by Qld) in place, adopted 08/01/08	2	Y	N
<i>Pomaderris brunnea</i>		Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by Vic) - contracted 2003-04	1	Y	N
<i>Prostanthera askania</i>		Endangered	Endangered	NPWS plan by January 2005 National plan by July 2003	Plan (by NSW) in place, adopted 09/05/07	3. 26-Jan-06	Y	Y
<i>Prostanthera cineolifera</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Prostanthera densa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Prostanthera</i> sp. <i>Somersby</i> (syn. <i>P. junonis</i>)		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 14/07/01	3	Y	N
<i>Pseudomys oralis</i>	Hastings river mouse	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 08/01/08	3. 26-Jan-06	Y	Y
<i>Psittaculirostris diophthalma coxeni</i> = <i>Cyclopsitta diophthalma coxeni</i>	Coxen's fig-parrot	Endangered	Endangered	National plan by July 2003	Plan (by Qld) in place, adopted 13/01/03	3. 04-Sep-02	Y	N
<i>Pterodroma leucoptera leucoptera</i>	Gould's petrel	Endangered	Endangered	National plan by July 2003	Plan (by NSW) in place, adopted 08/01/08	3	Y	N
<i>Pultenaea campbellii</i>			Vulnerable	National plan by July 2005	No plan commenced	3. 26-Jan-06	N	N
<i>Pultenaea stuartiana</i> = <i>Pultenaea foliolosa</i>			Vulnerable	National plan by July 2005	No plan commenced	5	N	N
<i>Quassia</i> sp. <i>Mooney Creek</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	3. 26-Jan-06	Y	Y
<i>Randia moorei</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	3. 26-Jan-06	Y	N

APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Rapanea</i> sp. <i>A Richmond River</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 11/04/05	3. 28-Jul-04	Y	N
<i>Rutidosia heterogama</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Sarcophilus fitzgeraldii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Sophora fraseri</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Sterna albifrons</i>	little tern	Endangered		National plan by July 2003		3. 16-Oct-03	Y	N
<i>Symplocos baeuerlenii</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Syzygium hodgkinsoniae</i>	red lilly-pilly; smooth-bark rose apple	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Syzygium moorei</i>	Coolamon robby; rose-apple	Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Syzygium paniculatum</i>	creek satin ash	Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by NSW) - contracted 2003-04	1	Y	Y
<i>Tasmannia glaucifolia</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Tasmannia purpurascens</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Tetratheca glandulosa</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Tetratheca juncea</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	1.	Y	N
<i>Thersites mitchellae</i>	northern tree snail	Endangered		NPWS plan by January 2005	Plan (by NSW) in place, adopted 20/02/04	3. 27-Jun-01	Y	N
<i>Thesium australe</i>		Vulnerable	Vulnerable	National plan by July 2005	Plan in prep (by Vic) - contracted 2002-03	1.	Y	Y
<i>Tinospora tinosporoides</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Turnix melanogaster</i>	black-breasted button-quail	Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	Plan in prep (by Qld) - contracted 2004-05	1	Y	N
<i>Tylophora woollsi</i>	-	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
NORTH EAST RFA**

Scientific name	Common name	NSW status	National status	Completion date in North East RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Uromyrtus australis</i>	-	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan in prep (by NSW)	3. 26-Jan-06	Y	N
<i>Velleia perfoliata</i>		Vulnerable	Vulnerable	National plan by July 2005	No plan commenced	5	Y	N
<i>Xanthomyza phrygia</i>	regent honeyeater	Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by Vic) in place, adopted 16/07/00, revised plan in prep (by NSW) - contracted 2002-03	2.	Y	N
<i>Xerothamnella parvifolia</i>		Endangered	Vulnerable	NPWS plan by January 2005, National plan by July 2005	No plan commenced	5	Y	N
<i>Zieria lasiocaulis</i>		Endangered	Endangered	NPWS plan by January 2005, National plan by July 2003	Plan (by NSW) in place, adopted 18/08/04	3. 27-Jul-02	Y	N

Key for recovery plan status: 1 = initial planning/in preparation/; 2 = draft complete or exhibited; 3 = plan approved (date); 4 = not started; 5 = replaced by PAS

Priority species for preparation of recovery plans for Southern RFA (over next five years)

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Acacia bynoeana</i>	Bynoe wattle	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by NSW) - contracted 2005–06	1	Y	N
<i>Acacia flocktoniae</i>		Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by NSW) - contracted 1998–99	1	Y	N
<i>Acacia georgensis</i>	Dr. George's wattle	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by NSW)	5	Y	N
<i>Acacia phasmoides</i>	phantom wattle	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) – contracted 2003–04	1.	Y	N
<i>Ammobium craspedioides</i>	Yass daisy	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	No plan commenced	2.	Y	N
<i>Aprasia parapulchella</i>	pink-tailed legless lizard	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by Vic) – contracted 2002–03	1.	Y	N
<i>Boronia deanei</i>	Deane's boronia	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Burhinus grallarius</i>	bush stone-curlew	Endangered	Not listed	State plan by December 2001		3. 02-Mar-06	Y	N
<i>Burramys parvus</i>	mountain pygmy-possum	Vulnerable	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by Vic) – contracted 2002–03	3. 27-May-02	Y	N
<i>Caladenia concolor</i>	crimson spider orchid	Endangered	Not listed	State plan by December 2001	Plan in prep (by Vic) – contracted 2005–06	5	Y	N
<i>Caladenia tessellata</i>	daddy long-legs	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) – contracted 2003–04	1.	Y	N
<i>Callitris oblonga</i>	pigmy corang cypress pine	Vulnerable	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	5	Y	N
<i>Calotis glandulosa</i>	mauve burr-daisy	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Calyptrorhynchus lathamii</i>	glossy black-cockatoo	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Chalinolobus dwyeri</i>	large pied bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N

**APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA**

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Charadrius rubricollis</i>	hooded plover	Endangered	Not listed	National plan by July 2005, State plan by December 2001		5	Y	N
<i>Correa baeuerlenii</i>	chef's cap correa	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Cryptostylis hunteriana</i>	leafless tongue orchid	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Cynanchum elegans</i>		Endangered	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	5	Y	N
<i>Daphnandra sp C (sp 1 Illawarra)</i>		Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by NSW) in place, adopted 10/06/05	3. 15-Dec-04	Y	N
<i>Dasyornis brachypterus</i>	eastern bristlebird	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW) – completion pending clarification of genetics to enable decision on whether separate plan by Qld for northern population should be combined with this one.	1.	Y	N
<i>Dasyurus maculatus</i>	tiger quoll	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) – covering subspecies maculatus and gracilis - contracted 2002–03	5	Y	N
<i>Delma impar</i>	striped legless lizard	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	Plan (by NSW) in place, adopted 10/05/00, revised plan in prep (by Vic)	1.	Y	N
<i>Discaria nitida</i>	anchor plant	Endangered	Not listed	State plan by December 2001		1.	Y	N
<i>Diuris aequalis</i>	buttercup doubletail	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Eucalyptus aquatica</i>	broad-leaved sallee	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Eucalyptus kartzoffiana</i>	Araluen gum	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Eucalyptus langleyi</i>	albatross mallee	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Eucalyptus parvula</i>	small-leaved gum	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N

**APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA**

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Eucalyptus pulverulenta</i>	silver-leaved gum	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Eucalyptus recurva</i>	Mongarlowe Mallee	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW)	2. 07-May-03	Y	Y
<i>Eucalyptus saxatilis</i>	Suggan Buggan mallee	Endangered	Not listed	State plan by December 2001		5	Y	N
<i>Eucalyptus sturgissiana</i>	Ettrema mallee	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Falsistrellus tasmaniensis</i>	great pipistrelle	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Genoplesium plumosum</i>	Tallong midge orchid	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by NSW) in place, adopted 20/02/04	3. 27-May-02	Y	N
<i>Genoplesium (now Corunastylis) vernale</i>	East Lynne midge orchid	vulnerable	Endangered	National plan by July 2003, State plan by March 2003	Plan (by NSW) in place, adopted 20/02/04	3. 25-Jun-02	Y	N
<i>Gentiana bredboensis</i>	Bredbo gentian	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Gentiana wingecarribiensis</i>	Wingecarribee gentian	Endangered	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	5	Y	N
<i>Grevillea iaspicula</i>	Wee Jasper grevillea	Vulnerable	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	1.	Y	N
<i>Grevillea molyneuxii</i>	Tallowa grevillea	Endangered	Endangered	National plan by July 2003, State plan by January 2001	No plan commenced	5	Y	N
<i>Grevillea rivularis</i>	Carrington falls grevillea	Endangered	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	2.	Y	N
<i>Grevillea wilkinsonii</i>	Tumut grevillea	Endangered	Endangered	National and State plan by January 2001	Plan (by NSW) in place, adopted 23/03/02	3 24/8/2001	Y	N
<i>Haloragis exalata exalata</i>	square raspwort	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) – contracted 2003–04	1	Y	N
<i>Heleioporus australiacus</i>	giant burrowing frog	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by NSW) – contracted 2003–04	1	Y	Y
<i>Hoplocephalus bungaroides</i>	broad headed snake	Endangered	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by NSW) - contracted 2003–04	1	Y	Y

**APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA**

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Irenepharsus trypherus</i>	delicate cress	Vulnerable	Endangered	National plan by July 2003, State plan by January 2006	Plan (by NSW) in place, adopted 10/06/05	3 15-Dec-04	Y	N
<i>Isodon obesulus obesulus</i>	southern brown bandicoot	Endangered	Endangered	State plan by December 2001	Plan in prep (by Vic) – contracted 2002–03	3 01-Nov-06	Y	Y
<i>Kerivoula papuensis</i>	golden-tipped bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Kunzea cabbagei</i>	cabbage kunzea	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Lathamus discolor</i>	swift parrot	Endangered	Endangered	National plan complete, State plan by December 2001	Plan (by Tas) in place, adopted 26/03/02, revised plan in prep (by NSW)	1	Y	N
<i>Leptospermum thompsonii</i>	Monga tea-tree	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	No plan commenced	5	Y	N
<i>Litoria aurea</i>	green and golden bell frog	Endangered	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by NSW)	2 21-Feb-05	Y	Y
<i>Litoria booroolongensis</i>	booroolong frog	Endangered	Not listed	State plan by December 2001	Commencement of plan pending	2	Y	N
<i>Lophoictinia isura</i>	square-tailed kite	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Mastacomys fuscus</i>	broad-toothed rat	Vulnerable	Not listed	State plan by December 2001		1	Y	Y
<i>Melaleuca biconvexa</i>	biconvex paperbark	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Micromyrtus minutiflora</i>		Vulnerable	Vulnerable	National plan by July 2000, State plan by January 2006	No plan commenced	5	Y	N
<i>Miniopterus schreibersii</i>	common bent-wing bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Mixophyes balbus</i>	stuttering barred frog	Vulnerable	Endangered	State plan by December 2001	Plan in prep (by Vic) – contracted 2002–03	1	Y	N
<i>Monotaxis macrophylla</i>	large-leaf monotaxis	Endangered	Not listed	State plan by December 2001		5	Y	N
<i>Monotoca rotundifolia</i>	trailing monotoca	Endangered	Not listed	State plan by December 2001		5	Y	N
<i>Mormopterus norfolkensis</i>	eastern little mastiff-bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Myotis adversus</i>	large-footed mouse-eared bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N

**APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA**

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Neophema pulchella</i>	turquoise parrot	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Ninox connivens</i>	barking owl	Vulnerable	Not listed	State plan by December 2001		2 10-Mar-03	Y	N
<i>Ninox strenua</i>	powerful owl	Vulnerable	Not listed	State plan by December 2001		3 01-Oct-06 (Large Forest Owls of NSW)	Y	N
<i>Pachycephala olivacea</i>	olive whistler	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Pedionomus torquatus</i>	plains wanderer	Endangered	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (Cwth made)	2	Y	N
<i>Persicaria elatior</i>	tall knotweed	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Persoonia glaucescens</i>	Mittagong geebung	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Petaurus australis</i>	yellow-bellied glider	Vulnerable	Not listed	State plan by January 2006		3. 18-Feb-03	Y	N
<i>Petaurus norfolcensis</i>	squirrel glider	Vulnerable	Not listed	State plan by January 2006		5	Y	
<i>Petrogale penicillata</i>	brush-tailed rock wallaby	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) - contracted 2002-03	3 11/07/08	Y	
<i>Petroica rodinogaster</i>	pink robin	Vulnerable	Not listed	State plan by January 2006		5	Y	
<i>Phascogale tapoatafa</i>	brush-tailed phascogale	Vulnerable	Not listed	State plan by January 2006		5	Y	
<i>Phascolarctos cinereus</i>	koala	Vulnerable	Not listed	State plan by December 2001		2 21-Mar-03	Y	
<i>Phyllota humifusa</i>	dwarf phyllota	Vulnerable	Not listed	State plan by January 2006		5	Y	
<i>Plinthanthesis rodwayi</i>	Budawangs wallaby-grass	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	1. (Threatened Flora of Budawangs)	Y	
<i>Polytelis swainsonii</i>	superb parrot	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) - contracted 2002-03	1	Y	
<i>Pomaderris cotoneaster</i>	cotoneaster pomaderris	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW) - contracted 2002-03	1	Y	Y

**APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA**

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Pomaderris gilmourii</i> var <i>cana</i>	grey deua pomaderris	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	
<i>Pomaderris pallida</i>	pale pomaderris	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	
<i>Pomaderris parrisiae</i>	parris' pomaderris	Endangered	Vulnerable	National plan by July 2005, State plan by December 2001	No plan commenced	5	Y	
<i>Pomaderris sericea</i>	silky pomaderris	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) - contracted 2001–02	5	Y	
<i>Potorous tridactylus</i>	long-nosed potoroo	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by Vic) - contracted 2002–03	1	Y	
<i>Prasophyllum affine</i>	Culburra leek orchid	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW)	2 07-May-03	Y	
<i>Prasophyllum morgani</i>	Cobungra leek orchid	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan (by Vic) in place, adopted 18/08/04	5	Y	
<i>Prasophyllum petilum</i>	Boorowa leek orchid	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW)	2 31-Jan-03	Y	
<i>Prasophyllum uroglossum</i>	Wingecarribee leaf orchid	Endangered	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	5	Y	
<i>Prostanthera densa</i>	villous mint-bush	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	
<i>Pseudomys fumeus</i>	smoky mouse	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by Vic) - contracted 2001–02	1	Y	
<i>Pseudophryne australis</i>	red-crowned toadlet	Vulnerable	Not listed	State plan by January 2006		5	Y	
<i>Pseudophryne pengilleyi</i>	northern corroboree frog	Vulnerable	Vulnerable	National plan by July 2005, State plan by December 2001	Plan in prep (by NSW)	2	Y	
<i>Pterostylis gibbosa</i>	pouched greenhood	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by NSW) in place, 20/02/04	3 10-Sep-02	Y	
<i>Pterostylis pulchella</i>	waterfall greenhood	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Pultenaea aristata</i>	prickly bush-pea	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N

APPENDIX 3. RECOVERY PLANS
SOUTHERN RFA

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Pultenaea baeuerlenii</i>	Budawangs bush-pea	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	1 (Threatened Flora of Budawangs)	Y	N
<i>Ranunculus anemoneus</i>	anemone buttercup	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2001	Plan (by NSW) in place, adopted 26/03/02	3 25-Jun-01 (Threatened Alpine Plant Species)	Y	N
<i>Restio longipes</i>	dense cord-rush	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Rulingia prostrata</i>	dwarf kerrawang	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by Vic) - contracted 2001–02	5	Y	N
<i>Rutidosis leiolepis</i>	Monaro golden daisy	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Rutidosis leptorrhynchoides</i>	button wrinklewort	Endangered	Endangered	National plan complete, State plan by December 2001	Plan in prep (by NSW) - contracted 2002–03	1	Y	N
<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail-bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Scoteanax rueppellii</i>	greater broad-nosed bat	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Sminthopsis leucopus</i>	white-footed dunnart	Vulnerable	Not listed	State plan by December 2002		5	Y	N
<i>Swainsona recta</i>	mountain swainson-pea	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW) - contracted 2002–03	1	Y	N
<i>Syzygium paniculatum</i>	creek satin ash	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by NSW) - contracted 2003–04	1	Y	N
<i>Thesium australe</i>	austral toad-flax	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) - contracted 2002–03	1	Y	N
<i>Triplarina nowraensis</i>	Nowra heath myrtle	Endangered	Endangered	National and State plan by December 2001	Plan in prep (by NSW)	2 14-Mar-03	Y	N
<i>Tyto novaehollandiae</i>	masked owl	Vulnerable	Not listed	State plan by December 2001		3 01-Oct-06 (Large Forest Owls of NSW)	Y	N
<i>Tyto tenebricosa</i>	sooty owl	Vulnerable	Not listed	State plan by December 2001		3 01-Oct-06 (Large Forest Owls of NSW)	Y	N

Scientific name	Common name	NSW status	National status	Completion date in Southern RFA	National recovery plan status	NSW recovery plan status see key	Species covered by NSW PAS actions? (Y/N)	NSW PAS actions require a recovery plan to be prepared? (Y/N)
<i>Varanus rosenbergi</i>	heath monitor	Vulnerable	Not listed	State plan by January 2006		5	Y	N
<i>Westringia kydrensis</i>	Kydra westringia	Endangered	Endangered	National plan by July 2003, State plan by December 2001	No plan commenced	5	Y	N
<i>Xanthomyza phrygia</i>	regent honeyeater	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by Vic) in place, adopted 16/07/00, revised plan in prep (by NSW) - contracted 2002–03	2	Y	N
<i>Zieria adenophora</i>	Araluen zieria	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by NSW) in place, adopted 26/03/02	3 25/06/2001	Y	N
<i>Zieria baeuerlenii</i>	Bomaderry zieria	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan in prep (by NSW)	1	Y	Y
<i>Zieria citriodora</i>	lemon zieria	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan in prep (by Vic) - contracted 2003–04	5	Y	N
<i>Zieria granulata</i>	narrow-leaf zieria	Endangered	Endangered	National plan by July 2003, State plan by December 2001	Plan (by NSW) in place, 10/06/05	3 15-Dec-04	Y	N
<i>Zieria involucrata</i>		Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	Plan (by NSW) in place, adopted 09/05/07	3 9 November 07	Y	Y
<i>Zieria murphyi</i>	velvet zieria	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N
<i>Zieria tuberculata</i>	warty zieria	Vulnerable	Vulnerable	National plan by July 2005, State plan by January 2006	No plan commenced	5	Y	N

Key for recovery plan status: 1 = initial planning/in preparation/; 2 = draft complete or exhibited; 3 = plan approved (date); 4 = not started; 5 = replaced by PAS

Appendix 4: Timber volumes and allowable cut

Agreement region: Lower North East

Log type	Units	2006–07			2005–06			2004–05			2003–04		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	cubic metres	111,537	160,000	125,814	135,744	160,000	125,814	127,539	160,000	125,814	169,762	160,000	125,814
Log type		31,127	-	36,588	29,316	-	36,588	24,780	-	36,588	28,640	-	36,588
Low-quality sawlogs		148,788	-	176,867	138,769	-	176,867	147,401	-	176,867	156,246	-	176,867
Pulp-grade and chipwood (domestic and export grades)	tonnes	121,162	-	120,000	97,170	-	120,000	108,647	-	120,000	114,976	-	120,000

Log type	Units	2002–03			2001–02			2000–01			1999–2000		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	cubic metres	170,171	160,000	na	177,036	160,000	na	135,845	160,000	na	167,529	160,000	na
Log type		23,904	-	na	15,862	-	na	27,022	-	na	45,650	-	na
Low-quality sawlogs		140,920	-	na	123,986	-	na	122,585	-	na	156,993	-	na
Pulp-grade and chipwood (domestic and export grades)	tonnes	164,887	-	na	94,480	-	na	243,927	-	na	141,082	-	na

Notes: NF and HWD plantation – Native forest and hardwood plantation
FA – forest agreement
WSA – wood supply agreement

Agreement region: Upper North East

Log type	Units	2006–07			2005–06			2004–05			2003–04		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	cubic metres	68,814	109,000	83,686	70,333	109,000	83,686	70,389	109,000	83,686	76,751	109,000	83,686
Log type		29,959	-	27,184	32,763	-	27,184	29,500	-	27,184	29,908	-	27,184
Low-quality sawlogs		69,148	-	153,677	88,219	-	153,677	86,258	-	153,677	88,202	-	153,677
Pulp-grade and chipwood (domestic and export grades)	Tonnes	12,269	-	45,000	19,220	-	45,000	11,648	-	45,000	16,264	-	45,000

Log type	Units	2002–03			2001–02			2000–01			1999–2000		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	cubic metres	81,880	109,000	na	101,944	109,00	na	91,254	109,000	na	118,444	109,000	na
Log type		25,981	-	na	29,782	-	na	58,47	-	na	66,382	-	na
Low-quality sawlogs		85,965	-	na	79,969	-	na	77,542	-	na	91,326	-	na
Pulp-grade and chipwood (domestic and export grades)	Tonnes	37,091	-	na	16,895	-	na	28,199	-	na	24,663	-	na

Notes: NF and HWD plantation – Native forest and hardwood plantation
 FA – forest agreement
 WSA – wood supply agreement

Agreement region: Southern

Log type	Units	2006–07			2005–06			2004–05			2003–04			2002–03		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	Cubic metres	62,272	96,500	79,008	60,673	96,500	79,008	53,369	96,500	79,008	70,021	96,500	79,008	62,329	96,500	79,008
Log type		10,100	-	10,890	9199	-	10,890	7259	-	10,890	6826	-	10,890	5419	-	10,890
Low-quality sawlogs		38,350	-	52,062	52,572	-	52,062	56,036	-	52,062	51,792	-	52,062	59,665	-	52,062
Pulp-grade and chipwood (domestic and export grades)	Tonnes	150,700	-	83,050	109,447	-	83,050	64,049	-	83,050	78,291	-	83,050	65,484	-	83,050

Notes: NF and HWD plantation – Native forest and hardwood plantation

FA – forest agreement

WSA – wood supply agreement

Agreement region: Eden

Log type	Units	2006–07			2005–06			2004–05			2003–04		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	Cubic metres	19,417	23,000	22,080	23,936	23,000	22,080	22,434	23,000	22,080	26,131	23,000	22,080
Log type		1275	-	1920	1681	-	1920	1232	-	1920	1257	-	1920
Low-quality sawlogs		7178	-	23,000	12,299	-	23,000	12,007	-	23,000	18,465	-	23,000
Pulp-grade and chipwood (domestic and export grades)	Tonnes	314,400	-	273,400	294,519	-	273,400	277,952	-	273,400	309,088	-	273,400

Log type	Units	2002–03			2001–02			2000–01			1999–2000		
		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut		NF & HWD plantation actual volume	Allowable cut	
			FA	WSA		FA	WSA		FA	WSA		FA	WSA
High-quality large sawlogs (incl. veneer and girders)	Cubic metres	21,901	23,000	na	25,329	23,000	na	27,056	23,000	na	23,735	23,000	na
Log type		1689	-	na	1125	-	na	2067	-	na	1950	-	na
Low-quality sawlogs		10,906	-	na	9294	-	na	9303	-	na	4089	-	na
Pulp-grade and chipwood (domestic and export grades)	tonnes	313,870	-	na	279,854	-	na	337,434	-	na	352,282	-	na

Notes: NF and HWD plantation – Native forest and hardwood plantation
 FA – forest agreement
 WSA – wood supply agreement

Appendix 5: List of forest-dwelling species

Mammals

Arboreal mammals			
UNE	LNE	Eden	Southern
Brush-tailed phascogale	Brush-tailed phascogale	Brush-tailed phascogale	Brush-tailed phascogale
Greater glider	Greater glider	Greater glider	Greater glider
Koala	Koala	Koala	Koala
Squirrel glider	Squirrel glider	Squirrel glider	Squirrel glider
Yellow-bellied glider	Yellow-bellied glider	Yellow-bellied glider	Yellow-bellied glider
			Eastern pygmy-possum
Bats			
UNE	LNE	Eden	Southern
Common bent-winged bat	Common bent-winged bat	Common bent-winged bat	Common bent-winged bat
Eastern cave bat	Eastern cave bat	Eastern cave bat	Eastern cave bat
Eastern false pipistrelle	Eastern false pipistrelle	Eastern false pipistrelle	Eastern false pipistrelle
Eastern mastiff bat	Eastern mastiff bat	Eastern mastiff bat	Eastern mastiff bat
Golden-tipped bat	Golden-tipped bat	Golden-tipped bat	Golden tipped bat
Greater broad-nosed bat	Greater broad-nosed bat	Greater broad-nosed bat	Greater broad-nosed bat
Grey headed flying fox	Grey headed flying fox	Grey headed flying fox	Grey-headed flying fox
			Large-eared pied bat
Large-footed myotis	Large-footed myotis	Large-footed myotis	Large-footed myotis
Little bent-winged bat	Little bent-winged bat	Little bent-winged bat	Little bent-winged bat
Yellow-bellied sheathtail bat	Yellow-bellied sheathtail bat	Yellow-bellied sheathtail bat	Yellow-bellied sheathtail bat
Ground mammals			
UNE	LNE	Eden	Southern
Broad-toothed rat	Broad-toothed rat	Broad-toothed rat	Broad-toothed rat
Brush-tailed rock-wallaby	Brush-tailed rock-wallaby	Brush-tailed rock-wallaby	Brush-tailed rock wallaby
Hastings river mouse	Hastings River mouse	Hastings River mouse	Hastings River mouse
Long-footed potoroo	Long-footed potoroo	Long-footed potoroo	Long-footed potoroo
Long-nosed potoroo	Long-nosed potoroo	Long-nosed potoroo	Long-nosed potoroo
Parma wallaby	Parma wallaby	Parma wallaby	Parma wallaby
Red-legged pademelon	Red-legged Pademelon	Red-legged pademelon	Red-legged pademelon
Rufous bettong	Rufous bettong	Rufous bettong	Rufous bettong
Smoky mouse	Smoky mouse	Smoky mouse	Smoky mouse
Southern brown bandicoot	Southern brown bandicoot	Southern brown bandicoot	Southern brown bandicoot
Tiger quoll	Tiger quoll	Tiger quoll	Tiger quoll
White-footed dunnart	White-footed dunnart	White-footed dunnart	White-footed dunnart
			Black stripped wallaby

Birds

Non-raptor birds			
UNE	LNE	Eden	Southern
Albert's lyrebird	Albert's lyrebird	Albert's lyrebird	Albert's lyrebird
			Black-necked stork
			Black-chinned honeyeater (<i>Melithreptus gularis</i>)
			Brown treecreeper (<i>Climacteris picumnus</i>)
Bush-stone curlew	Bush-stone curlew	Bush-stone curlew	Bushstone curlew
			Diamond firetail (<i>Stagonopleura guttata</i>)
			Gang-gang cockatoo (<i>Callocephalon fimbriatum</i>)
Glossy black-cockatoo	Glossy black-cockatoo	Glossy black-cockatoo	Glossy black cockatoo
			Grey-crowned babbler (eastern subsp.)
			Hooded robin (<i>Melanodryas cucullata</i>)
Marbled frogmouth	Marbled frogmouth	Marbled frogmouth	Marble frogmouth
Olive whistler	Olive whistler	Olive whistler	Olive whistler
Pink robin	Pink robin	Pink robin	Pink robin
Regent honeyeater	Regent honeyeater	Regent honeyeater	Regent honeyeater
Regent parrot	Regent parrot	Regent parrot	Regent parrot
Rufous scrub-bird	Rufous scrub-bird	Rufous scrub-bird	Rufous scrub-bird
			Speckled warbler (<i>Chthonicola sagittata</i>)
Superb parrot	Superb parrot	Superb parrot	Superb parrot
Swift parrot	Swift parrot	Swift parrot	Swift parrot
Turquoise parrot	Turquoise parrot	Turquoise parrot	Turquoise parrot
Wompoo fruit dove	Wompoo fruit dove	Wompoo fruit dove	Wompoo fruit dove
			White-eared monarch
Raptor birds			
UNE	LNE	Eden	Southern
Barking owl	Barking owl	Barking owl	Barking owl
Masked owl	Masked owl	Masked owl	Masked owl
Powerful owl	Powerful owl	Powerful owl	Powerful owl
Red goshawk	Red goshawk	Red goshawk	Red goshawk
Sooty owl	Sooty owl	Sooty owl	Sooty owl
Square-tailed kite	Square-tailed kite	Square-tailed kite	Square-tailed kite

Reptiles and frogs

Reptiles			
UNE	LNE	Eden	Southern
Broad-headed snake	Broad-headed snake	Broad-headed snake	Broad-headed snake
Heath monitor	Heath monitor	Heath monitor	Heath monitor
Pale headed snake	Pale headed snake	Pale headed snake	Pale-headed snake
			Rosenberg's goanna
Stephens banded snake	Stephens banded snake	Stephens banded snake	Stephens banded snake
Frogs			
UNE	LNE	Eden	Southern
Corroboree frog	Corroboree frog	Corroboree frog	Corroboree frog
			Davies' tree frog
Giant barred frog	Giant barred frog	Giant barred frog	Giant barred frog
Giant burrowing frog	Giant burrowing frog	Giant burrowing frog	Giant burrowing frog
Glandular frog	Glandular frog	Glandular frog	Glandular frog
Green and golden bell frog	Green and golden bell frog	Green and golden bell frog	Green and golden bell frog
Green-thighed frog	Green-thighed frog	Green-thighed frog	Green-thighed frog
Heath frog	Heath frog	Heath frog	Heath frog
Pouched frog	Pouched frog	Pouched frog	Pouched frog
Red-crowned toadlet	Red-crowned toadlet	Red-crowned toadlet	Red-crowned toadlet
Sphagnum frog	Sphagnum frog	Sphagnum frog	Sphagnum frog
Stuttering frog	Stuttering frog	Stuttering frog	Stuttering frog
			Fleay's barred frog

Flora

Flora			
UNE	LNE	Eden	Southern
<i>Acacia chrysotricha</i>	<i>Acacia chrysotricha</i>		<i>Acacia chrysotricha</i>
<i>Acacia courtii</i>	<i>Acacia courtii</i>		<i>Acacia courtii</i>
<i>Amorphospermum whitei</i>	<i>Amorphospermum whitei</i>		<i>Amorphospermum whitei</i>
<i>Angophora inopina</i>	<i>Angophora inopina</i>		<i>Angophora inopina</i>
<i>Boronia umbellata</i>	<i>Boronia umbellata</i>		<i>Boronia umbellate</i>
<i>Corynocarpus rupestris rupestris</i>	<i>Corynocarpus rupestris rupestris</i>		<i>Corchorus cunninghamii</i>
<i>Corchorus cunninghamii</i>	<i>Corchorus cunninghamii</i>		<i>Corynocarpus rupestris rupestris</i>
<i>Eucalyptus glaucina</i>	<i>Eucalyptus glaucina</i>		<i>Eucalyptus glaucina</i>
<i>Eucalyptus tetraplaura</i>	<i>Eucalyptus tetraplaura</i>		<i>Eucalyptus tetraplaura</i>
<i>Euphrasia ciliolata</i>	<i>Euphrasia ciliolata</i>	<i>Euphrasia ciliolata</i>	<i>Euphrasia ciliolate</i>
<i>Grevillea acanthifolia paludosa</i>	<i>Grevillea acanthifolia paludosa</i>		<i>Grevillea acanthifolia paludosa</i>
<i>Hakea archaeoides</i>	<i>Hakea archaeoides</i>		<i>Hakea archaeoides</i>
<i>Hibbertia superans</i>	<i>Hibbertia superans</i>		<i>Hibbertia superans</i>
<i>Hicksbeachia pinnatifolia</i>	<i>Hicksbeachia pinnatifolia</i>		<i>Hicksbeachia pinnatifolia</i>
<i>Macrozamia johnsonii</i>	<i>Macrozamia johnsonii</i>		<i>Macrozamia johnsonii</i>
<i>Marsdenia longilobia</i>	<i>Marsdenia longilobia</i>		<i>Marsdenia longilobia</i>
<i>Melaleuca biconvexa</i>	<i>Melaleuca biconvexa</i>		<i>Melaleuca biconvexa</i>
<i>Melaleuca groveana</i>	<i>Melaleuca groveana</i>	<i>Melaleuca groveana</i>	<i>Melaleuca groveana</i>
<i>Melaleuca irbyana</i>	<i>Melaleuca irbyana</i>		<i>Melaleuca irbyana</i>
<i>Melichrus hirsutus</i>	<i>Melichrus hirsutus</i>		<i>Melichrus hirsutus</i>
<i>Olearia flocktoniae</i>	<i>Olearia flocktoniae</i>		<i>Olearia flocktoniae</i>
<i>Parsonsia dorrigoensis</i>	<i>Parsonsia dorrigoensis</i>		<i>Parsonsia dorrigoensis</i>
<i>Philotheca myoporoides obovatifolia</i>	<i>Philotheca myoporoides obovatifolia</i>		<i>Philotheca myoporoides obovatifolia</i>
<i>Phyllanthus microcladus</i>	<i>Phyllanthus microcladus</i>		<i>Phyllanthus microcladus</i>
<i>Pomaderris queenslandica</i>	<i>Pomaderris queenslandica</i>		<i>Pomaderris queenslandica</i>
<i>Pterostylis elegans</i>	<i>Pterostylis elegans</i>		<i>Pterostylis elegans</i>
<i>Quassia</i> sp. 'Moonee Creek'	<i>Quassia</i> sp. 'Moonee Creek'		<i>Quassia</i> sp. 'Moonee Creek'
<i>Senna acclinis</i>	<i>Senna acclinis</i>		<i>Senna acclinis</i>
<i>Tetradlea juncea</i>	<i>Tetradlea juncea</i>		<i>Tetradlea juncea</i>
<i>Typhonium</i> Sp. aff. <i>brownii</i>	<i>Typhonium</i> Sp. aff. <i>brownii</i>		<i>Typhonium</i> sp. aff. <i>brownii</i>
		Large-leaved pepperbush	

Appendix 6: Threatened species listing³⁶

Presumed extinct species

Species	Gazetted
<i>Caladenia rosella</i> (a terrestrial orchid)	Friday, December 13, 2002
Lord Howe Island ground weevil	Friday, December 13, 2002

Critically endangered species listing

Species	Gazetted
<i>Banksia conferta</i> A.S.George subsp. <i>conferta</i>	Friday, August 10, 2007
<i>Persoonia pauciflora</i> (North Rothbury persoonia)	Friday, September 07, 2007
Orange-bellied parrot	Monday, September 03, 2007
<i>Pomaderris walshii</i>	Friday, April 20, 2007
<i>Prasophyllum canaliculatum</i> D.L. Jones	Friday, August 10, 2007
<i>Prasophyllum innubum</i> (terrestrial orchid)	Friday, 28 March 2008
<i>Prasophyllum keltonii</i> (terrestrial leek orchid)	Friday, 28 March 2008
<i>Prostanthera marifolia</i>	Friday 04 July 2008
<i>Pterostylis despectans</i> (terrestrial herb)	Friday, 28 March 2008
<i>Pterostylis oreophila</i> (an orchid)	Friday, November 09, 2007
<i>Thelymitra atronitida</i> (an orchid)	Friday, November 09, 2007
<i>Thelymitra</i> sp. 'Adorata'	Friday 04 July 2008

Endangered species listing

Species	Gazetted
<i>Acacia atrox</i> (a tall shrub)	Friday, July 13, 2001
<i>Acacia bynoeana</i> (a shrub)	Friday, September 17, 1999
<i>Acacia chrysotricha</i> (a tree)	Friday, July 07, 2000
<i>Acacia dangarensis</i> (a small tree)	Friday, November 25, 2005
<i>Acacia gordonii</i> (a wattle)	Friday, June 06, 1997
<i>Acacia terminalis</i> subsp. <i>terminalis</i> (a shrub)	Friday, March 06, 1998
<i>Alexfloydia repens</i> (a grass)	Friday, July 13, 2001
Alpine tree frog	Friday, March 15, 2002
<i>Angophora exul</i> (a tree)	Friday, February 26, 1999
<i>Aponogeton queenslandicus</i> (an aquatic plant)	Friday, November 17, 2000
<i>Asterolasia buxifolia</i> (a shrub)	Friday, November 01, 2002
<i>Asterolasia</i> sp. 'Dungowan Creek' (a shrub)	Friday, June 25, 2004
<i>Astrotricha cordata</i> (a shrub)	Friday, October 05, 2001
<i>Astrotricha</i> sp. <i>Wallagaraugh</i>	Friday, February 16, 2007
<i>Babingtonia prominens</i> (a shrub)	Friday, July 21, 2000
<i>Babingtonia silvestris</i> (a shrub)	Friday, April 27, 2001

³⁶ As at 4 July 2008

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
PRESUMED EXTINCT, CRITICALLY ENDANGERED AND ENDANGERED SPECIES**

Species	Gazetted
<i>Baeckea kandos</i> (a shrub)	Friday, December 15, 2000
Bardick	Friday, November 14, 2003
Bathurst copper butterfly	Friday, November 15, 1996
<i>Belvisia mucronata</i> (a fern)	Friday, November 30, 2001
<i>Bertya</i> sp. (Chambigne NR, M. Fatemi 24)	Monday, April 23, 2007
Black grass-dart butterfly	Friday, December 20, 2002
Black-necked stork	Friday, January 30, 1998
Blue whale	Friday, May 24, 2002
Booroolong frog	Friday, March 13, 1998
<i>Boronia boliviensis</i> (a shrub)	Friday, July 07, 2000
<i>Boronia hapalophylla</i> (a shrub)	Friday, November 12, 2004
<i>Boronia ruppilii</i> (a shrub)	Friday, April 28, 2000
<i>Brachyscome ascendens</i> (a perennial daisy)	Friday, July 13, 2001
Brush-tailed rock wallaby	Friday, July 04, 2003
<i>Caesalpinia bonduc</i> (a scrambling shrub)	Friday, December 05, 2003
<i>Caladenia arenaria</i> (a terrestrial orchid)	Friday, July 18, 1997
<i>Caladenia concolor</i> (a terrestrial orchid)	Friday, July 18, 1997
<i>Caladenia porphyrea</i>	Friday, July 21, 2006
<i>Caladenia tessellate</i> (a terrestrial orchid)	Friday, December 13, 2002
<i>Calochilus pulchellus</i>	Friday 23 May 2008
<i>Calotis pubescens</i> (a perennial forb)	Friday, December 06, 2002
<i>Calystegia affinis</i> (a twining plant)	Friday, November 01, 2002
<i>Camarophyllopsis kearneyi</i> (an agaric fungus)	Friday, September 06, 2002
<i>Capparis canescens</i> (a small tree)	Friday, August 23, 2002
<i>Carex archeri</i> (a herb)	Friday, April 02, 2004
<i>Carex klaphakei</i> (a tall perennial herb)	Friday, March 03, 2000
<i>Carmichaelia exsul</i> (a shrub)	Friday, November 01, 2002
<i>Cassia brewsteri</i> var. <i>marksiana</i> (a tree)	Friday, November 03, 2000
<i>Centranthera cochinchinensis</i> (a herb)	Friday, September 12, 2003
<i>Chamaesyce psammogeton</i> (a prostrate herb)	Friday, March 13, 1998
<i>Chiloglottis anaticeps</i> (an orchid)	Friday, November 03, 2000
<i>Commersonia rosea</i> (a shrub)	Friday, November 12, 2004
<i>Convolvulus tedmoorei</i> (a perennial plant)	Friday, December 13, 2002
<i>Coprosma inopinata</i> (a shrub)	Friday, November 01, 2002
<i>Correa lawrenciana</i> var. <i>genoensis</i> (a shrub)	Friday, December 13, 2002
<i>Corybas dowlingii</i> (an orchid)	Friday, November 09, 2007
Cumberland Plain land snail	Friday, August 08, 1997
<i>Cupaniopsis serrata</i> (a small tree)	Friday, November 07, 2003
<i>Cyclodomorphus venustus</i> (a lizard)	Friday, December 06, 2002
<i>Cyperus semifertilis</i> (a sedge)	Friday, July 13, 2001
<i>Dampiera fusca</i>	Friday, September 07, 2007

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
PRESUMED EXTINCT, CRITICALLY ENDANGERED AND ENDANGERED SPECIES**

Species	Gazetted
Delicate mouse	Friday, July 22, 2005
<i>Dendrobium melaleucaphilum</i> (an epiphytic orchid)	Friday, October 27, 2000
<i>Dillwynia glaucula</i> (a shrub)	Friday, July 23, 1999
<i>Distichlis distichophylla</i> (a grass)	Friday, September 15, 2000
<i>Diuris arenaria</i> (a terrestrial orchid)	Friday, May 26, 2000
<i>Diuris bracteata</i> (an orchid)	Friday, October 21, 2005
<i>Diuris disposita</i> (a terrestrial orchid)	Friday, November 06, 1998
<i>Diuris flavescens</i> (a terrestrial orchid)	Friday, November 06, 1998
<i>Diuris ochroma</i> (an orchid)	Friday, April 29, 2005
<i>Diuris</i> sp. (an orchid)	Friday, February 09, 2001
<i>Diuris</i> sp. aff. <i>chrysantha</i> (an orchid)	Friday, July 07, 2000
<i>Diurus aequalis</i> (a terrestrial orchid)	Friday, November 01, 2002
<i>Dodonaea stenozyga</i> subsp. <i>acrodentata</i> (an erect rounded shrub)	Friday, February 23, 2001
<i>Drynaria rigidula</i> (a fern)	Tuesday, August 04, 1998
Dugong	Friday, May 24, 2002
Dusky hopping-mouse	Friday, June 25, 2004
Eastern bristlebird	Friday, January 31, 1997
<i>Eidothea</i> sp. 'Nightcap Range' (a tree)	Friday, January 18, 2002
<i>Eleocharis tetraquetra</i> (a sedge)	Friday, July 09, 1999
<i>Elyonurus citreus</i> (a perennial grass)	Friday, September 12, 2003
<i>Eriocaulon australasicum</i> (a herb)	Friday, July 23, 1999
<i>Eucalyptus castrensis</i> (a tree)	Friday, December 17, 2004
<i>Eucalyptus magnificata</i> (a tree)	Friday, July 07, 2000
<i>Eucalyptus saxicola</i> (a small tree)	Friday, December 13, 2002
<i>Eucalyptus scoparia</i> (a tree)	Friday, August 23, 2002
<i>Eucalyptus</i> sp. <i>cattai</i> (a small tree)	Friday, December 18, 1998
<i>Euphrasia orthocheila</i> (an annual herb)	Friday, December 13, 2002
<i>Euphrasia scabra</i> (a herb)	Friday, August 13, 1999
Fleay's barred frog	Friday, July 21, 2000
<i>Galium australe</i> (a herb)	Friday, December 17, 2004
<i>Geniostoma huttonii</i> (a shrub)	Friday, December 05, 2003
<i>Genoplesium insignis</i> (a terrestrial orchid)	Friday, October 05, 2001
<i>Genoplesium plumosum</i> (a terrestrial orchid)	Friday, July 18, 1997
<i>Genoplesium superbum</i>	Friday, November 25, 2005
<i>Gentiana bredboensis</i>	Friday, July 04, 2003
<i>Geodorum densiflorum</i> (a terrestrial orchid)	Friday, July 13, 2001
Giant barred frog	Friday, August 13, 1999
Giant dragonfly	Friday, January 30, 1998
Golden sun moth	Friday, November 15, 1996
<i>Goodenia</i> sp. 'Nocoleche' (a herb)	Friday, December 17, 2004
Gould's petrel	Friday, January 30, 1998

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
PRESUMED EXTINCT, CRITICALLY ENDANGERED AND ENDANGERED SPECIES**

Species	Gazetted
<i>Grevillea divaricata</i> (a shrub)	Friday, June 15, 2001
<i>Grevillea hilliana</i> (a tree)	Friday, July 13, 2001
<i>Grevillea parviflora</i> subsp. <i>supplicans</i> (a low shrub)	Friday, December 24, 1999
<i>Grevillea renwickiana</i> (a prostrate shrub)	Friday, December 06, 2002
Grey grasswren	Friday, June 25, 2004
<i>Gyrostemon thesioides</i> (a shrub)	Friday, September 11, 1998
Hairy-nosed freetail bat	Friday, September 17, 2004
<i>Hibbertia puberula</i>	Friday, September 12, 2003
<i>Hibbertia</i> sp. Nov. 'Menai'	Friday, August 10, 2007
<i>Hibbertia superans</i> (a low spreading shrub)	Friday, October 05, 2001
<i>Hibbertia tenuifolia</i> (a decumbent shrub)	Thursday, May 10, 2001
<i>Homoranthus binghiensis</i> (a shrub)	Friday, March 15, 2002
<i>Homoranthus bornhardtensis</i> (a shrub)	Friday, July 23, 1999
<i>Homoranthus croftianus</i> (a shrub)	Friday, July 23, 1999
<i>Hygrocybe austropratensis</i> (an agaric fungus)	Friday, September 06, 2002
<i>Hygrocybe collucera</i> (an agaric fungus)	Friday, December 20, 2002
<i>Hygrocybe griseoramosa</i> (an agaric fungus)	Friday, December 20, 2002
<i>Hygrocybe lanecovensensis</i> (an agaric fungus)	Friday, September 06, 2002
<i>Hypsela sessiliflora</i>	Friday, July 04, 2003
<i>Indigofera baileyi</i> (a perennial herb)	Friday, December 06, 2002
Laced fritillary or Australian fritillary butterfly	Friday, December 20, 2002
<i>Lasiopetalum behrii</i> (a shrub)	Friday, April 19, 2002
Leopard ctenotus	Friday, November 01, 2002
<i>Lepidium peregrinum</i> (a herb)	Friday, July 07, 2000
<i>Leptorhynchus orientalis</i> (an annual herb)	Friday, December 13, 2002
<i>Leucopogon fletcheri</i> subsp. <i>fletcheri</i> (a shrub)	Friday, December 24, 1999
<i>Lindernia alsinoides</i> (a herb)	Friday, August 27, 2004
Loggerhead turtle	Friday, October 05, 2001
Lord Howe Island phasmid	Friday, December 13, 1996
Lord Howe Island wood-feeding cockroach	Friday, February 13, 2004
Loveridge's frog	Friday, April 29, 2005
<i>Macrozamia humilis</i> (a perennial cycad)	Friday, December 13, 2002
Mallee slender blue-tongue lizard	Friday, September 12, 2003
Mallee worm-lizard	Friday, September 17, 2004
Marble-faced delma	Friday, September 12, 2003
<i>Melaleuca tamariscina</i> subsp. <i>irbyana</i> (a shrub)	Friday, July 23, 1999
<i>Melichrus</i> sp. <i>Gibberagee</i> (a shrub)	Friday, July 09, 1999
<i>Melicope vitiflora</i> (a small tree)	Friday, December 06, 2002
<i>Micromyrtus grandis</i> (a large shrub)	Friday, June 06, 1997
<i>Micromyrtus minutiflora</i> (a shrub)	Friday, December 20, 2002
<i>Microtis angusii</i> (a terrestrial orchid)	Friday, June 06, 1997

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
PRESUMED EXTINCT, CRITICALLY ENDANGERED AND ENDANGERED SPECIES**

Species	Gazetted
Mitchell's rainforest snail	Friday, March 14, 1997
<i>Mitrasacme pygmaea</i> (an annual herb)	Friday, April 02, 2004
Mountain frog	Friday, April 29, 2005
Mountain pygmy-possum	Friday, March 16, 2001
<i>Niemeyera chartacea</i> (a tree)	Friday, April 19, 2002
<i>Nitella partita</i> (a form of algae)	Friday, December 03, 2004
<i>Nurus atlas</i> (a beetle)	Friday, March 16, 2001
<i>Nurus brevis</i> (a beetle)	Friday, March 16, 2001
<i>Oberonia complanata</i> (an orchid)	Friday, December 20, 2002
Orange-bellied parrot	Friday, December 15, 2000
Painted burrowing frog	Friday, August 08, 1997
Painted snipe	Friday, June 25, 2004
<i>Pericryptodrilus nanus</i> (an earthworm)	Friday, March 16, 2001
<i>Persoonia bargoensis</i> (a shrub)	Friday, July 07, 2000
<i>Persoonia glaucescens</i> (a shrub)	Friday, December 13, 2002
<i>Persoonia hindii</i> (a shrub)	Friday, November 17, 2000
<i>Persoonia hirsuta</i> (a spreading to decumbant shrub)	Friday, June 12, 1998
<i>Persoonia pauciflora</i> (a spreading shrub)	Friday, August 06, 1999
<i>Phaius australis</i> (a tall swamp orchid)	Friday, June 12, 1998
<i>Phebalium bifidum</i> (a shrub)	Friday, October 21, 2005
<i>Philoria pughii</i> (a frog)	Friday, April 29, 2005
<i>Philoria richmondensis</i> (a frog)	Friday, April 29, 2005
<i>Philotheca myoporoides</i> subsp. <i>obovatifolia</i> (a shrub)	Friday, July 23, 1999
<i>Phyllodes imperialis</i> , southern subspecies (a moth)	Friday, December 05, 2003
<i>Pimelea axiflora</i> subsp. <i>pubescens</i>	Friday, April 20, 2007
<i>Placostylus bivaricosus</i> (a large land snail)	Friday, April 04, 1997
<i>Plinthanthesis rodwayi</i> (a grass)	Friday, November 01, 2002
<i>Polystichum moorei</i> (a fern)	Friday, November 01, 2002
<i>Pomaderris adnata</i> (a shrub)	Friday, February 09, 2001
<i>Pomaderris delicata</i> (a shrub)	Friday, December 06, 2002
<i>Pomaderris reperta</i> (a shrub)	Friday, December 13, 2002
<i>Prasophyllum bargoensis</i> (an orchid)	Friday, November 12, 2004
<i>Prasophyllum</i> sp. <i>Majors Creek</i> (a terrestrial orchid)	Friday, December 06, 2002
<i>Prostanthera askania</i> (a shrub)	Friday, June 12, 1998
<i>Prostanthera staurophylla</i> F. Muell. <i>sensu stricto</i>	Thursday, April 13, 2006
<i>Pterostylis metcalfei</i> (a terrestrial orchid)	Friday, October 05, 2001
<i>Pterostylis saxicola</i> (an orchid)	Friday, October 31, 1997
<i>Pultenaea pedunculata</i> (a prostrate shrub)	Friday, July 23, 1999
<i>Pultenaea</i> sp. <i>genowlan Point</i> (a shrub)	Friday, September 18, 1998
<i>Pultenaea</i> sp. <i>olinda</i> (a shrub)	Friday, October 16, 1998
<i>Rapanea</i> sp. <i>A Richmond River</i> (a shrub/small tree)	Friday, September 04, 1998

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
PRESUMED EXTINCT, CRITICALLY ENDANGERED AND ENDANGERED SPECIES**

Species	Gazetted
Ringed brown snake	Friday, August 27, 2004
<i>Rotala tripartita</i> (a herb)	Friday, 28 March 2008
<i>Sarcochilus dilatatus</i> (an epiphytic orchid)	Friday, February 09, 2001
<i>Sclerolaena napiformis</i> (a small perennial shrub)	Friday, August 06, 1999
<i>Senecio linearifolius</i> var. <i>dangarensis</i> (a shrub)	Friday, October 21, 2005
<i>Solanum armourense</i> (a shrub)	Friday, November 07, 2003
<i>Solanum celatum</i> (a shrub)	Friday, November 07, 2003
<i>Solanum limitare</i> (a shrub)	Friday, November 07, 2003
<i>Sophora tomentosa</i> (a shrub)	Friday, June 15, 2001
South-eastern lined earless dragon	Friday, November 15, 1996
Southern corroboree frog	Friday, November 15, 1996
Southern giant petrel	Friday, October 05, 2001
Southern hairy-nosed wombat	Friday, August 08, 1997
Stuttering frog	Friday, December 13, 2002
Swift parrot	Friday, March 24, 2000
Tawny crevice-dragon	Friday, December 20, 2002
<i>Triplarina nowraensis</i> (a shrub)	Friday, June 06, 1997
<i>Typhonium</i> sp. aff. <i>Brownie</i> (a plant)	Friday, September 24, 1999
Wandering albatross	Friday, November 15, 1996
Western pygmy possum	Friday, August 08, 1997
<i>Wilsonia rotundifolia</i> (a perennial dwarf subshrub)	Friday, September 15, 2000
<i>Xylosma parvifolium</i> (a shrub)	Friday, November 01, 2002
<i>Xylosma terrae -reginae</i> (a small tree or shrub)	Friday, September 29, 2000
<i>Zannichellia palustris</i> (a submerged aquatic plant)	Friday, June 12, 1998
<i>Zieria citriodora</i> (a shrub)	Friday, December 06, 2002
<i>Zieria involucrata</i> (a shrub)	Friday, December 13, 2002
Zigzag velvet gecko	Friday, June 25, 2004

Vulnerable species listing

Species	Gazetted
<i>Acacia ausfeldii</i>	Friday, September 07, 2007
<i>Acacia bakeri</i> (a tree)	Friday, November 17, 2000
<i>Ancistrachne maidenii</i> (a perennial grass)	Friday, July 23, 1999
<i>Angophora inopina</i> (a tree)	Friday, May 15, 1998
Antipodean albatross	Friday, October 05, 2001
<i>Archidendron hendersonii</i> (a tree)	Friday, November 03, 2000
Australian fur-seal	Friday, May 24, 2002
Barking owl	Friday, June 12, 1998
Bellinger River emydura	Friday, February 21, 1997
Bell's turtle	Friday, January 10, 1997
Black-browed albatross	Friday, January 31, 1997
Black-chinned honeyeater (eastern subspecies)	Friday, October 26, 2001
<i>Boronia granitica</i> (a shrub)	Friday, December 13, 2002
Brown treecreeper (eastern subspecies)	Friday, October 26, 2001
<i>Callistemon linearifolius</i> (a shrub)	Friday, December 24, 1999
<i>Chiloglottis platyptera</i> (a terrestrial orchid)	Friday, February 09, 2001
Crowned gecko	Friday, June 25, 2004
<i>Cyperus rupicola</i> (a sedge)	Friday, November 01, 2002
<i>Darwinia glaucophylla</i> (a prostrate shrub)	Friday, December 13, 2002
<i>Darwinia peduncularis</i> (a shrub)	Friday, March 12, 1999
<i>Derwentia blakelyi</i> (a shrub)	Friday, November 03, 2000
Diamond firetail	Friday, October 26, 2001
<i>Discaria nitida</i> (a shrub)	Friday, November 03, 2000
<i>Doryanthes palmeri</i> (giant rosette plant)	Friday, December 06, 2002
<i>Dracophyllum macranthum</i>	Friday 04 July 2008
Eastern pygmy possum	Friday, June 08, 2001
<i>Epacris purpurascens</i> var. <i>purpurascens</i> (a shrub)	Friday, December 24, 1999
<i>Eucalyptus boliviana</i> (a shrub or tree)	Friday, December 06, 2002
<i>Eucalyptus corticosa</i> (a tree)	Friday, November 30, 2001
<i>Eucalyptus dissita</i> (a mallee tree)	Friday, November 17, 2000
<i>Eucalyptus fracta</i>	Friday, July 30, 1999
<i>Eucalyptus leucoxydon</i> subsp. <i>pruinosa</i>	Friday, February 16, 2007
<i>Eucalyptus macarthurii</i> (a tree)	Friday, October 21, 2005
<i>Eucalyptus oresbia</i> (a tree)	Friday, March 15, 2002
<i>Euphrasia ciliolata</i> (a herb)	Friday, January 18, 2002
Gang-gang cockatoo	Friday, July 22, 2005
<i>Genoplesium baueri</i> (an orchid)	Friday, July 23, 2004
<i>Genoplesium vernale</i> (a terrestrial orchid)	Friday, October 05, 2001
Gibson's albatross	Friday, October 05, 2001
<i>Grevillea juniperina</i> subsp. <i>juniperina</i> (a shrub)	Friday, April 28, 2000

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
VULNERABLE SPECIES**

Species	Gazetted
<i>Grevillea molyneuxii</i>	Friday, December 24, 1999
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> (a shrub)	Friday, June 12, 1998
Grey-crowned babbler (eastern subspecies)	Friday, October 26, 2001
Grey-headed flying fox	Friday, May 04, 2001
Hooded robin (south-eastern form)	Friday, October 26, 2001
<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i> (an agaric fungus)	Friday, September 06, 2002
<i>Hygrocybe aurantipes</i> (an agaric fungus)	Friday, July 19, 2002
<i>Hygrocybe reesiaae</i> (an agaric fungus)	Friday, July 19, 2002
<i>Hygrocybe rubronivea</i> (an agaric fungus)	Friday, April 02, 2004
Jewelled gecko	Friday, June 25, 2004
<i>Kunzea rupestris</i> (a shrub)	Friday, March 12, 1999
<i>Lasiopetalum joyceae</i> (a shrub)	Friday, February 26, 1999
<i>Lepiderema pulchella</i> (a tree)	Friday, June 15, 2001
<i>Lepidosperma evansianum</i> (a perennial herb)	Friday, May 26, 2000
<i>Litoria daviesae</i> (a tree frog)	Friday, December 13, 2002
Littlejohn's tree frog	Friday, May 26, 2000
<i>Maundia triglochinooides</i> (a herb)	Friday, June 15, 2001
<i>Melaleuca biconvexa</i> (a small tree)	Friday, September 18, 1998
<i>Melaleuca deanei</i> (a shrub)	Friday, September 17, 1999
<i>Melaleuca</i> sp. <i>Megalong Valley</i>	Friday, November 14, 2003
<i>Muehlenbeckia costata</i> (a scrambling herb)	Friday, November 01, 2002
New Zealand fur-seal	Friday, May 24, 2002
Northern corroboree frog	Friday, November 15, 1996
Northern giant petrel	Friday, November 14, 2003
<i>Oberonia titania</i> (an orchid)	Friday, November 07, 2003
<i>Peristeranthus hillii</i> (an orchid)	Friday, June 11, 2004
<i>Pimelea curviflora</i> (a small shrub)	Friday, July 31, 1998
<i>Pomaderris bodalla</i> (a shrub)	Friday, November 18, 2005
<i>Pomaderris notata</i> (a shrub)	Friday, December 20, 2002
<i>Prostanthera spinosa</i> (a shrub)	Friday, November 18, 2005
<i>Pterostylis elegans</i> (a terrestrial orchid)	Friday, December 06, 2002
<i>Pultenaea humilis</i>	Friday 04 July 2008
<i>Pultenaea maritima</i> (a shrub)	Friday, September 24, 2004
Red-backed button-quail	Friday, October 21, 2005
Red-crowned toadlet	Friday, July 19, 2002
<i>Rhizanthella slateri</i> (an underground orchid)	Friday, December 06, 2002
<i>Rhynchosia acuminatissima</i> (a climbing herb)	Friday, April 02, 2004
Shy albatross	Friday, January 31, 1997
Sloane's froglet <i>Crinia sloanei</i>	Friday, 28 March 2008
Sooty albatross	Friday, January 31, 1997
Speckled warbler	Friday, October 26, 2001

APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
VULNERABLE SPECIES

Species	Gazetted
<i>Swainsona sericea</i> (a shrub)	Friday, December 24, 1999
<i>Velleia perfoliata</i> (a perennial herb)	Friday, September 11, 1998
<i>Wedgesnout ctenotus</i>	Friday, June 25, 2004
<i>Wilsonia backhousei</i> (a perennial matforming subshrub)	Friday, September 15, 2000
<i>Xanthosia scopulicola</i> (a herb)	Friday, November 07, 2003
Yellow-tailed plain slider	Friday, June 25, 2004

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
CRITICALLY ENDANGERED, ENDANGERED, AND VULNERABLE ECOLOGICAL COMMUNITIES AND
POPULATIONS**

Critically endangered ecological communities

Critically endangered ecological community	Date
Blue gum high forest in the Sydney Basin Bioregion	Friday, April 20, 2007
Kincumber scribbly gum forest in the Sydney Basin Bioregion	Friday 04 July 2008

Endangered ecological communities

Endangered ecological community	Date
<i>Acacia loderi</i> shrublands	Friday, October 06, 2000
<i>Acacia melvillei</i> shrubland in the Riverina and Murray-Darling Depression bioregions	Friday 04 July 2008
Agnes Banks woodland in the Sydney Basin Bioregion	Friday, November 03, 2000
<i>Allocasuarina luehmannii</i> woodland in the Riverina and Murray-Darling Depression bioregions	Friday, 28 March 2008
Artesian springs ecological community	Friday, June 15, 2001
Bangalay sand forest, Sydney Basin and South East Corner bioregions	Friday, October 21, 2005
Bega dry grass forest in the South East Corner Bioregion	Friday, November 17, 2000
Ben Halls Gap National Park sphagnum moss cool temperate rainforest community	Friday, July 24, 1998
Blue Mountains shale cap forest in the Sydney Basin Bioregion	Friday, October 06, 2000
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains bioregions	Friday, August 23, 2002
Brigalow-Gidgee woodland/shrubland in the Mulga Lands and Darling Riverine Plains Bioregions	Friday, April 08, 2005
Brogo wet vine forest in the South East Corner Bioregion	Friday, November 17, 2000
Byron Bay Dwarf graminoid clay heath community	Friday, February 11, 2000
<i>Cadellia pentastylis</i> community in the Nandewar and Brigalow Belt South bioregions	Friday, September 11, 1998
Candelo dry grass forest in the South East Corner Bioregion	Friday, November 17, 2000
Carbeen open forest community in the Darling Riverine Plains and Brigalow Belt South bioregions	Friday, October 29, 1999
Castlereagh swamp woodland community	Friday, December 24, 1999
Coastal saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, June 04, 2004
Cooks River/Castlereagh ironbark forest in the Sydney Basin Bioregion	Thursday, May 10, 2001
Coolibah – Black Box Woodland of the northern riverine plains in the Darling Riverine Plains and Brigalow Belt South bioregions	Friday, May 14, 2004
Cumberland Plain woodland	Friday, June 13, 1997
Dry rainforest of the south east forests in the South East Corner Bioregion	Friday, November 17, 2000
Duffys Forest ecological community in the Sydney Basin Bioregion	Friday, June 28, 2002
Eastern Suburbs banksia scrub in the Sydney Basin Bioregion	Friday, August 23, 2002
Elderslie banksia scrub forest community	Friday, February 26, 1999
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, December 17, 2004
Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Friday, September 24, 2004
Genowlan Point Allocasuarina nana heathland	Friday, December 18, 1998

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
CRITICALLY ENDANGERED, ENDANGERED, AND VULNERABLE ECOLOGICAL COMMUNITIES AND
POPULATIONS**

Endangered ecological community	Date
<i>Halosarcia lylei</i> low open-shrubland in the Murray Darling Depression Bioregion	Friday, December 17, 2004
Hunter lowland redgum forest in the Sydney Basin and NSW North Coast bioregions	Friday, December 13, 2002
Hunter Valley weeping myall woodland of the Sydney Basin Bioregion	Friday, November 25, 2005
<i>Hygrocybeae</i> community of Lane Cove Bushland Park	Friday, March 03, 2000
Illawarra lowlands grassy woodland in the Sydney Basin Bioregion	Friday, December 24, 1999
Illawarra subtropical rainforest in the Sydney Basin Bioregion	Friday, November 01, 2002
Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	Friday, April 27, 2007
Kurnell dune forest in the Sutherland Shire and the City of Rockdale	Friday, January 29, 1999
Kurri sand swamp woodland in the Sydney Basin Bioregion	Friday, June 01, 2001
Lagunaria swamp forest on Lord Howe Island	Friday, December 05, 2003
Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, June 04, 2004
Low woodland with heathland on indurated sand at Norah Head	Friday, July 24, 1998
Lower Hunter spotted gum – ironbark forest in the Sydney Basin Bioregion	Friday, February 18, 2005
Lowland grassy woodland in the South East Corner Bioregion	Friday, August 10, 2007
Lowland rainforest in NSW North Coast and Sydney Basin Bioregion	Friday, December 22, 2006
Lowland rainforest on floodplain in the NSW North Coast Bioregion	Friday, August 13, 1999
Maroota Sands swamp forest	Friday, October 17, 1997
McKies stringybark/blackbutt open forest in the Nandewar and New England Tableland bioregions	Friday, February 09, 2001
Melaleuca armillaris tall shrubland in the Sydney Basin Bioregion	Friday, August 23, 2002
Milton Ulladulla subtropical rainforest in the Sydney Basin Bioregion	Friday, November 01, 2002
Moist shale woodland in the Sydney Basin Bioregion	Friday, April 19, 2002
Montane peatlands and swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	Friday, December 17, 2004
Mount Canobolas Xanthoparmelia lichen community	Friday, October 05, 2001
Mount Gibraltar forest in the Sydney Basin Bioregion	Friday, March 16, 2001
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Friday, July 15, 2005
Native vegetation on cracking clay soils of the Liverpool Plains	Friday, October 26, 2001
New England peppermint woodland on sediments in the New England Tableland Bioregion	Friday, November 07, 2003
Newnes Plateau shrub swamp in the Sydney Basin Bioregion	Friday, July 15, 2005
O'Hares Creek shale forest community	Friday, December 18, 1998
Pittwater spotted gum forest	Friday, December 18, 1998
Quorrobolong scribbly gum woodland in the Sydney Basin Bioregion	Friday, August 23, 2002
Ribbon gum – mountain gum – snow gum grassy forest/woodland of the New England Tableland Bioregion	Friday, October 21, 2005
River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, December 17, 2004
Robertson basalt tall open-forest in the Sydney Basin Bioregion	Friday, June 15, 2001
Robertson rainforest in the Sydney Basin Bioregion	Friday, June 15, 2001

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
CRITICALLY ENDANGERED, ENDANGERED, AND VULNERABLE ECOLOGICAL COMMUNITIES AND
POPULATIONS**

Endangered ecological community	Date
Sandhill pine woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Friday, 28 March 2008
Semi-evergreen vine thicket in the Brigalow Belt South and Nandewar bioregions	Friday, December 24, 1999
Shale gravel transition forest in the Sydney Basin Bioregion	Friday, April 19, 2002
Shale/sandstone transition forest	Friday, September 11, 1998
Southern Highlands shale woodlands in the Sydney Basin Bioregion	Friday, June 15, 2001
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	Friday, September 07, 2007
Subtropical coastal floodplain forest of the NSW North Coast bioregion	Friday, December 17, 2004
Sun Valley cabbage gum forest in the Sydney Basin Bioregion	Friday, November 30, 2001
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, December 17, 2004
Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, December 17, 2004
Sydney freshwater wetlands in the Sydney Basin Bioregion	Friday, December 22, 2000
Sydney turpentine-ironbark forest	Friday, October 16, 1998
Tableland basalt forest in the Sydney Basin and South Eastern Highlands Bioregions	Friday, 4 January 2008
The shorebird community occurring on the relict tidal delta sands at Taren Point	Tuesday, September 29, 1998
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner bioregions	Friday, October 21, 2005
Umina coastal sandplain woodland in the Sydney Basin Bioregion	Friday, December 06, 2002
Upland wetlands of the drainage divide of the New England Tableland Bioregion	Friday, June 28, 2002
Warkworth Sands woodland in the Sydney Basin Bioregion	Friday, December 13, 2002
Western Sydney dry rainforest in the Sydney Basin Bioregion	Friday, March 24, 2000
White box yellow box Blakely's red gum woodland	Friday, March 15, 2002
White gum moist forest in the NSW North Coast Bioregion	Friday 04 July 2008

Vulnerable ecological communities

Vulnerable ecological community	Gazetted
Blue Mountains swamps in the Sydney Basin Bioregion	Friday, August 10, 2007
Lower Hunter valley dry rainforest in the Sydney Basin and NSW North Coast bioregions	Friday 04 July 2008

Endangered population listing

Endangered population	Gazetted
<i>Acacia pendula</i> (a tree) in the Hunter catchment	Friday, April 29, 2005
<i>Acacia prominens</i> (Gosford wattle) population, Hurstville and Kogarah local government areas	Tuesday, September 29, 1998
Australian brush-turkey population, Nandewar and Brigalow Belt South bioregions	Friday, October 21, 2005
Broad-toothed rat population, Barrington Tops	Friday, July 13, 2001
<i>Chorizema parviflorum</i> Benth. (a shrub) population, Wollongong and Shellharbour local government areas	Friday, October 05, 2001
Cymbidium canaliculatum R. Br.	Thursday, April 13, 2006

**APPENDIX 6. THREATENED SPECIES AND COMMUNITIES
CRITICALLY ENDANGERED, ENDANGERED, AND VULNERABLE ECOLOGICAL COMMUNITIES AND
POPULATIONS**

Endangered population	Gazetted
<i>Darwinia fascicularis</i> subsp. <i>oligantha</i> population, Baulkham Hills and Hornsby local government areas	Friday, March 03, 2000
<i>Dillwynia tenuifolia</i> (a shrub) population, Kemps Creek	Friday, November 28, 1997
<i>Dillwynia tenuifolia</i> population, Baulkham Hills Shire Local Government Area	Friday, November 07, 2003
<i>Diuris tricolor</i> , the pine donkey orchid population in the Muswellbrook local government area	Friday, April 27, 2007
Emu population in the NSW North Coast Bioregion and Port Stephens Local Government Area	Friday, September 06, 2002
<i>Eucalyptus camaldulensis</i> (a tree) in the Hunter catchment	Friday, April 29, 2005
<i>Eucalyptus oblonga</i> (a tree) population, Bateau Bay	Friday, December 03, 2004
<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i> population, Wyong and Lake Macquarie local government areas	Friday, November 07, 2003
<i>Eucalyptus seeana</i> Maiden population, Greater Taree local government area	Friday, July 12, 2002
Gang-gang cockatoo population, Hornsby and Ku-ring-gai local government areas	Friday, February 23, 2001
Glossy black-cockatoo population, Riverina	Friday, July 23, 1999
<i>Glycine clandestina</i> (broad leaf form) population in Nambucca local government area	Friday, March 16, 2001
Greater Glider	Friday, September 07, 2007
<i>Keraudrenia corrolata</i> var. <i>denticulata</i> in the Hawkesbury local government area	Friday, October 06, 2000
Koala population, Hawks Nest and Tea Gardens	Friday, August 13, 1999
Koala population, Pittwater local government area	Friday, November 27, 1998
<i>Leonema lamprophyllum</i> subsp. <i>obovatum</i> in the Hunter Catchment	Friday, April 27, 2007
<i>Lespedeza juncea</i> population in the Wollongong local government area	Friday, June 15, 2001
Little penguin population, Manly Point area	Friday, October 27, 2000
Long-nosed bandicoot population, North Head	Friday, February 28, 1997
Long-nosed potoroo population, Cobaki Lakes and Tweed Heads West	Friday, December 03, 2004
<i>Marsdenia viridiflora</i> R. Br subsp. <i>viridiflora</i> in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	Friday, December 20, 2002
<i>Menippus fugitivus</i> (a beetle) population, Sutherland Shire	Friday, March 03, 2000
<i>Pomaderris prunifolia</i> (a shrub) population, Parramatta, Auburn, Strathfield and Bankstown local government areas	Friday, January 29, 1999
<i>Pultenaea villifera</i> population in the Blue Mountains local government area	Friday, August 23, 2002
<i>Rhizanthella slateri</i>	Friday, December 08, 2006
Squirrel glider population, Barrenjoey Peninsula	Friday, September 06, 1996
Squirrel glider population, Wagga Wagga Local Government Area	Friday, July 07, 2000
Tusked frog population, Nandewar and New England Tablelands bioregions	Friday, December 15, 2000
<i>Wahlenbergia multicaulis</i> (Tadgell's bluebell) population, Auburn, Bankstown, Strathfield and Canterbury local government areas	Friday, September 05, 1997
<i>Wahlenbergia multicaulis</i> population, Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield local government areas	Friday, November 07, 2003
White-browed treecreeper population, Carrathool	Friday, December 06, 2002
White's skink population, Broken Hill Complex Bioregion	Friday, November 18, 2005
Woronora Plateau population of <i>Callitris endlicheri</i> (a tree)	Friday, November 12, 2004
<i>Zieria smithii</i> population, Diggers Head	Friday, September 18, 1998

Key threatening processes

Key threatening process	Date
Alteration of habitat following subsidence due to longwall mining	Friday, July 15, 2005
Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands	Friday, May 31, 2002
Anthropogenic climate change	Friday, November 03, 2000
Bushrock removal	Friday, November 05, 1999
Cane toad	Friday, April 21, 2006
Clearing of native vegetation	Friday, September 21, 2001
Competition and grazing by the feral European rabbit	Thursday, May 10, 2001
Competition and habitat degradation by feral goats	Friday, November 12, 2004
Competition from feral honeybees	Friday, November 29, 2002
Death or injury to marine species following capture in shark control programs on ocean beaches	Friday, December 05, 2003
Ecological consequences of high-frequency fires	Friday, March 24, 2000
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	Friday, February 13, 2004
Exotic vines and scramblers	Friday, April 21, 2006
Feral pigs	Friday, August 27, 2004
Herbivory and environmental degradation caused by feral deer	Friday, December 17, 2004
Importation of red imported fire ants into NSW	Friday, August 23, 2002
Infection by <i>Psittacine circoviral</i> (beak and feather) disease affecting endangered psittacine species and populations	Friday, December 06, 2002
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Friday, August 22, 2003
Infection of native plants by <i>Phytophthora cinnamomi</i>	Friday, December 13, 2002
Introduction of the large earth bumblebee, <i>Bombus terrestris</i>	Friday, February 13, 2004
Invasion and establishment of Scotch broom	Friday, November 09, 2007
Invasion of native plant communities by bitou bush and boneseed	Friday, March 12, 1999
Invasion of native plant communities by exotic perennial grasses	Friday, September 12, 2003
Invasion of the yellow crazy ant	Friday, August 19, 2005
<i>Lantana camara</i>	Friday, September 08, 2006
Loss and/or degradation of sites used for hill-topping by butterflies	Friday, April 20, 2001
Loss of hollow-bearing trees	Friday, October 05, 2007
Predation by feral cats	Friday, March 24, 2000
Predation by the European red fox	Friday, March 20, 1998
Predation by the plague minnow (<i>Gambusia holbrooki</i>)	Friday, January 29, 1999
Predation by the ship rat on Lord Howe Island	Friday, May 12, 2000
Removal of dead wood and dead trees	Friday, December 12, 2003

Appendix 7: Forest management zoning

Agreement region: Upper North East

Forest management zones	2005–06		2004–05		2003–04		2002–03		2001–02		2000–01		1999–00	
	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent
Formal reserve	2202	0.47%	2205	0.47%	2204	0.47%	2657	0.52%	2657	0.59%	2660	0.52%	2660	0.57%
Informal reserve – special management	52,080	11.06%	52,105	11.08%	52,256	11.24%	63,082	12.41%	63,142	13.99%	63,321	12.40%	63,322	13.52%
Informal reserve – harvest exclusion	90,019	19.12%	90,062	19.14%	90,050	19.38%	108,812	21.40%	108,827	24.12%	108,797	21.31%	108,874	23.25%
Special prescription	2027	0.43%	2041	0.43%	2035	0.44%	2399	0.47%	2441	0.54%	2411	0.47%	2411	0.51%
General management native forest	198,968	42.26%	199,066	42.31%	199,016	42.83%	205,535	40.43%	203,175	45.03%	204,407	40.04%	204,409	43.66%
Forests NSW hardwood planted estate	57,790	12.27%	57,237	12.17%	49,757	10.71%	53,412	10.51%	4782	1.06%	48,493	9.50%	21,061	4.50%
Forests NSW softwood planted estate	22,219	4.72%	22,224	4.72%	23,950	5.15%	24,259	4.77%	15,832	3.51%	31,826	6.23%	16,837	3.60%
Non forestry use	1799	0.38%	1819	0.39%	1797	0.39%	2024	0.40%	3581	0.79%	2075	0.41%	2075	0.44%
Land for further assessment	43,762	9.29%	43,690	9.29%	43,651	9.39%	46,209	9.09%	46,787	10.37%	46,562	9.12%	46,563	9.95%
Total	470,867	100%	470,449	100%	464,715	100%	508,388	100%	451,224	100%	510,552	100%	468,212	100%

Agreement region: Lower North East

Forest management zones	2005–06		2004–05		2003–04		2002–03		2001–02		2000–01		1999–2000	
	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent
Formal reserve	3977	0.81%	3999	0.81%	3993	0.81%	6584	1.18%	6593	1.19%	6587	1.11%	6597	1.17%
Informal reserve – special management	79,453	16.15%	79,680	16.07%	79,504	16.18%	106,917	19.16%	107,782	19.44%	107,881	18.14%	107,881	19.20%
Informal reserve – harvest exclusion	76,093	15.47%	77,333	15.60%	77,019	15.68%	90,814	16.27%	91,641	16.53%	91,717	15.42%	91,717	16.32%
Special prescription	6076	1.23%	6128	1.24%	6069	1.24%	6634	1.19%	5891	1.06%	5874	0.99%	5874	1.05%
General management native forest	226,767	46.09%	228,203	46.02%	227,132	46.23%	240,509	43.09%	242,144	43.68%	241,581	40.63%	241,581	42.98%
Forests NSW hardwood planted estate	16,212	3.30%	16,149	3.26%	14,863	3.03%	18,243	3.27%	15,940	2.88%	48,493	8.16%	20,654	3.67%
Forests NSW softwood planted estate	17,521	3.56%	17,521	3.53%	16,643	3.39%	17,760	3.18%	15,813	2.85%	31,826	5.35%	20,245	3.60%
Non forestry use	1093	0.22%	1124	0.23%	1093	0.22%	1345	0.24%	1352	0.24%	1468	0.25%	1468	0.26%
Land for further assessment	64,808	13.17%	65,691	13.25%	64,979	13.23%	69,336	12.42%	67,142	12.11%	59,180	9.95%	66,003	11.74%
Total	491,999	100%	495,827	100%	491,293	100%	558,141	100%	554,298	100%	594,607	100%	562,020	100%

Agreement region: Southern

Forest management zones	2005–06		2004–05		2003–04		2002–03	
	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent
Formal reserve	2259	0.47%	2265	0.47%	2266	0.45%	2592	0.55%
Informal reserve – special management	18,429	3.81%	20,132	4.15%	18,471	3.69%	20,096	4.24%
Informal reserve – harvest exclusion	24,362	5.04%	27,420	5.65%	25,262	5.04%	27,568	5.82%
Special prescription	7670	1.59%	7786	1.61%	7685	1.53%	7786	1.64%
General management native forest	216,893	44.89%	223,565	46.10%	221,305	44.17%	223,529	47.21%
Forests NSW hardwood planted estate	40	0.01%	40	0.01%	33	0.01%	9	0.01%
Forests NSW softwood planted estate	202,237	41.86%	202,306	41.72%	224,932	44.89%	187,354	39.57%
Non forestry use	1432	0.30%	1417	0.29%	1114	0.22%	1417	0.30%
Land for further assessment	9797	2.03%	0	0.00%	0	0.00%	3112	0.66%
Total	483,118	100%	484,931	100%	501,068	100%	473,463	100%

Agreement region: Eden

Forest management zones	2005–06		2004–05		2003–04		2002–03		2001–02		2000–01		1999–2000	
	area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	Area (ha)	per cent	area (ha)	per cent	area (ha)	per cent	Area (ha)	per cent
Formal reserve	7888	3.84%	7897	3.85%	7889	3.65%	7888	3.72%	7889	3.90%	8403	4.16%	8403	4.07%
Informal reserve – special management	3112	1.51%	3106	1.52%	3116	1.44%	3114	1.47%	3121	1.55%	3129	1.55%	3129	1.52%
Informal reserve – harvest exclusion	6381	3.11%	6382	3.10%	6399	2.96%	6387	3.01%	6388	3.15%	6414	3.17%	6414	3.11%
Special prescription	12,866	6.26%	12,871	6.26%	12,872	5.96%	12,887	6.07%	12,886	6.36%	12,758	6.31%	12,940	6.27%
General management native forest	131,913	64.18%	131,879	64.16%	132,241	61.19%	133,695	63.02%	131,990	65.18%	132,509	65.54%	132,509	64.18%
Forests NSW hardwood planted estate	0	0.00%	0	0.00%	0	0.00%	598	0.28%	339	0.17%	511	0.25%	1,100	0.53%
Forests NSW softwood planted estate	42,413	20.63%	42,308	20.58%	47,351	21.91%	42,848	20.20%	39,000	19.26%	3,8303	18.95%	41,820	20.26%
Non forestry use	150	0.07%	151	0.07%	151	0.07%	0	0.00%	151	0.07%	151	0.07%	151	0.07%
Land for further assessment	821	0.40%	951	0.46%	6089	2.82%	4737	2.23%	731	0.36%	0	0.00%	0	0.00%
Total	205,544	100%	205,545	100%	216,107	100%	212,154	100%	202,495	100%	202,178	100%	206,466	100%

Appendix 8: Timber volumes by grade

Agreement region: Lower North East

Log type	Units	2005-06			2004-05			2003-04			2002-03		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	4038	1917	864	3705	1291	2705	4186	3561	9806	4213	1407	
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	123,035	6754	0	118,200	4343	344	153,123	8,892	725	155,060	8084	
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	26,144	3172	0	23,095	1685	0	26,321	2319	nrs	23,904	nrs	
Low-quality sawlogs	cubic metres	105,860	32,909	5413	102,709	44,692	5749	111,624	44,622	3447	109,643	31,277	
Poles/piles and girders	cubic metres	13,271	8073	0	13,348	5058	0	12,362	4406	0	12,735	4087	
Preservation logs	cubic metres		0	0		0	0	0	0	0	0	0	
Mining timber (round)	cubic metres		0	0		0	0	0	0	0	0	0	
Pulp-grade and chipwood	tonnes	69,513	27,657	0	82,805	25,842	0	88,286	26,690	0	138,578	26,309	
Fencing/landscape/sleepers (sawn)	cubic metres	1888		0	964		0	1005	0	0	1404	0	

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Lower North East (cont.)

Log type	Units	2001–02			2000–01			1999–2000		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	1655	28	70,191	4234	997	51,405	3314	1410	79,501
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	174,463	890	41,693	130,300	314	72,467	162,048	757	94,105
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	13,754	2108	nrs	19,367	7655	nrs	20,958	24,692	nrs
Low-quality sawlogs	cubic metres	107,423	16,563	20,438	112,328	10,257	12,749	152,112		14,832
Poles/piles and girders	cubic metres	10,642	2103	0	14,642	3686	0	12,321		0
Preservation logs	cubic metres	0	0	0	0	0	0	0		0
Mining timber (round)	cubic metres	0		0	88	0	0	26		0
Pulp-grade and chipwood	tonnes	67,848	26,632	0	199,930	43,997	23,746	83,084		6839
Fencing/landscape/sleepers (sawn)	cubic metres	38,642	0	105	764	0	105	14,935		0

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Upper North East

Log type	Units	2005–06			2004–05			2003–04			2002–03		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	5766	1034	38,191	5477	1770	68,507	3287	3895	73,900	6454	1202	78,281
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	62,473	1060	54,024	60,444	2698	58,171	65,945	3624	51,508	68,291	5913	66,640
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	32,128	635	nrs	28,730	770	nrs	29,209	699	nrs	25,981	nrs	nrs
Low-quality sawlogs	cubic metres	69,201	19,018	31,932	66,387	19,871	35,309	73,346	14,856	36,653	60,087	25,878	60,026
Poles/piles and girders	cubic metres	11,029	3292	0	8715	3657	0	8,890	3063	0	10,271	218	0
Preservation logs	cubic metres	0	0	0	0	0	0	0	0	0	0	0	784
Mining timber (round)	cubic metres	0	0	0	0	0	0	0	0	0	0	0	0
Pulp-grade and chipwood	tonnes	11,846	7374	3778	7431	4217	6953	11,002	5262	9090	22,829	14,262	3689
Fencing/landscape/sleepers (sawn)	cubic metres							0	0	0	0	0	0

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Upper North East (cont.)

Log type	Units	2001–02			2000–01			1999–2000		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	6494	15	79,501	8655	1410	51,405	7243	1410	70,191
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	95,089	346	94,105	80,671	518	72,467	109,273	518	41,693
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	27,836	1946	0	33,997	24,473	recorded above	41,909	24,473	nrs
Low-quality sawlogs	cubic metres	64,962	15,007	14,832	77,396	146	12,749	91,180	146	20,438
Poles/piles and girders	cubic metres	15,680	1037	0	19,180	1239	0	15,865	239	0
Preservation logs	cubic metres	0	0	0	0	0	0	0	0	0
Mining timber (round)	cubic metres	0	0	0	0	0	0	0	0	0
Pulp-grade and chipwood	tonnes	899	15,996	6,839	3536	24,663	23,746	0	24,663	0
Fencing/landscape/sleepers (sawn)	cubic metres	240	0	0	2516	0	105	6844	0	28

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Eden

Log type	Units	2005–06			2004–05			2003–04			2002–03		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	0	0	0	0	0	0	0	0	0	0	0	0
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	23,936	0	143,756	22,434	0	143,038	26,131	0	115,024	21,901	0	85,267
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	1681	0	nrs	1232	0	nrs	1257	0	nrs	1689	0	nrs
Low-quality sawlogs	cubic metres	12,299	0	27,919	12,007	0	38,078	18,465	0	44,404	10,906	0	20,073
Poles/piles and girders	cubic metres	0	0		0	0		0	0		0	0	0
Preservation logs	cubic metres	0	0	16,596	0	0	27,163	0	0	37,327	0	0	30,209
Mining timber (round)	cubic metres	0	0		0	0		0	0		0	0	0
Pulp-grade and chipwood	tonnes	294,119	400	114,114	274,205	3,747	101,310	309,088	0	60,076	313,870	0	32,909
Fencing/landscape/sleepers (sawn)	cubic metres	0	0	0	0	0	0	43	0	0	24,391	0	0

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Eden (cont.)

Log type	Units	2001/02			2000/01			1999/00		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres	0	0	0	0	0	0	0	0	0
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	25,329	0	84,579	27,056	0	87,721	23,735	0	70,443
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	1125	0	nrs	2067	0	nrs	1950	0	nrs
Low-quality sawlogs	cubic metres	9294	0	0	9303	0	0	4089	0	0
Poles/piles and girders	cubic metres	0	0	0	0	0	0	0	0	0
Preservation logs	cubic metres	0	0	45,912	0	0	36,392	0	0	44,729
Mining timber (round)	cubic metres	0	0	0	0	0	0	0	0	0
Pulp-grade and chipwood	tonnes	279,854	0	31,520	337,434	0	11,825	352,282	0	48,960
Fencing/landscape/sleepers (sawn)	cubic metres	279	0	0	221	0	0	0	0	0

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Agreement region: Southern

Log type	Units	2005–06			2004–05			2003–04			2002–03		
		native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation	native forest	hardwood plantation	softwood plantation
Veneer logs	cubic metres		0	0	241	0	199	172	0	183	0		0
High-quality large sawlogs (>40cm native, >18cm cypress, >24cm softwood)	cubic metres	60,673	0	986,106	53,128	0	887,630	69,849	0	925,329	62,329		40,125
High-quality small sawlogs (<40cm native, <18cm cypress, <24cm softwood)	cubic metres	9199	0	0	7259	0	0	6826	0	nrs	5419		nrs
Low-quality sawlogs	cubic metres		0	2443	56,036	0	7038	51,792	0	2237	59,665		9446
Poles/piles and girders	cubic metres	52,572	0	0	180	0	0	155	0	0	0		0
Preservation logs	cubic metres	0	0	8981	0	0	7629	0	0	7226	0		13,746
Mining timber (round)	cubic metres		0			0		0	0	0	0		0
Pulp-grade and chipwood	tonnes	109,447	0	519,372	64,049	0	531,252	78,291	0	571,634	65,484		15,486
Fencing/landscape/sleepers (sawn)	cubic metres	13,606	0	0	19,677	0	0	619	0	0	152		0

nrs = not reported separately – high-quality small sawlogs are included in the figures for high-quality sawlogs for the softwood plantation estate.

Appendix 9: Non-timber forest products

Agreement region: Eden

Forest product	Unit	2005-06	2004-05	2003-04	2002-03	2001-02	2000-01	1999-2000
Grazing – dedicated Crown lease	hectares	3436	3436	3436	3436	5966	3436	3500
Grazing – occupation permit	hectares	1408	1408	1241	2040	1579	1440	1600
Grazing – grazing permit	hectares	2193	3877	3818	4171	0	n/a	2051
Apiculture	sites	102	162	164	159	84	57	56
Firewood	tonnes	689	865	384	935	937	890	691
Wood blocks	number	0	0	0	112	90	90	86
Film/documentary	permits	5	0	0	0	0	0	0
Communication sites	permits	8	8	7	8	8	5	6
Other structures	permits	7	7	7	3	2	0	6
Powerlines/cables/pipelines	kilometres	50	50	50	50	50	50	20.8
Gravel/sand/rock	tonnes	56,616	54,103	76,203	43,236	25,016	24,892	21,000
Research permits	number	2	6	10	14	17	105	100
Maps sold to public	number	159	163	0	0	0	0	0

Agreement region: Lower North East

Forest product	Unit	2005-06	2004-05	2003-04	2002-03	2001-02	2000-2001	1999-2000
Grazing	hectares	68,203	78,700	74,970	115,671	86,995	69,047	90,082
Apiculture	sites	336	385	246	226	315	236	274
Seed	kilograms	3	2	3	0	0	65	65
Bark	tonnes	0	0	0	1	4	2	15
Firewood	tonnes	1733	1852	2000	1760	2935	2656	4579
Craft timber	cubic metres	3	0	2	3	5	7	14
Miscellaneous native plant pieces	number	3767	102,344	10,977	1692	1276	7210	144,624
Burls	tonnes	0	0	1	3	1	12	6
Wood blocks	number	0	0	0	0	0	0	824
Film/documentary	permits	3	1	0	1	2	0	1
Communication sites	permits	53	53	49	57	41	26	40
Other structures	permits	39	50	51	56	43	42	39
Powerlines/cables/pipelines	kilometres	63	98	98	101	205	221	425.1
Gravel/sand/rock	tonnes	300	312	1824	11,000	4828	8390	20225
Research permits	number	16	20	12	13		105	100
Maps sold to public	number	162	1077	0	0	0	0	0

Agreement region: Upper North East

Forest product	Unit	2005-06	2004-05	2003-04	2002-03	2001-02	2000-01	1999-2000
Grazing	hectares	187,166	219,973	121,640	245,071	200,949	282,556	257,705
Apiculture	sites	980	984	393	382	1084	1120	1083
Leaf /oil	kilograms	0	0	0	0	0	0	6050
Seed	kilograms	0	9	10	0	40	2,298	151
Bark	tonnes	0	0	4	4	4	8	20
Firewood	tonnes	125	364	297	40	770	828	660
Craft timber	cubic metres	0	0	0	0	156	6	3
Miscellaneous native plants pieces	number	0	120	1605	1714	3037	2470	4554
Wood blocks	number	0	0	0	0	0	0	435
Film/documentary	permits	0	0	0	0	0	1	0
Communication sites	permits	30	30	7	20	29	43	27
Other structures	permits	17	17	124	16	11	18	53
Powerlines/cables/pipelines	kilometres	3	0	6	6	285	296	49.7
Gravel/sand/rock	tonnes	0	500	10,388	0	5048	5269	2916
Research	research permits	3	7	15	13	n/a	105	100
Nursery seedlings to public	number	0	0	0	n/a	n/a	n/a	250,000
Maps sold to public	number	700	600	0	0	0	0	0

Agreement region: Southern

Forest product	Unit	2005–06	2004–05	2003–04	2002–03
Grazing	hectares	112,353	84,615	73,243	82,750
Apiculture	sites	1193	1148	1055	1055
Leaf /oil	kilograms	0	0	81	1000
Seed	kilograms	50	290	512	25
Bark	tonnes	0	0	0	0
Firewood	tonnes	5786	4673	6838	5011
Craft timber	cubic metres	3	5	4	0
Miscellaneous native plants pieces	number	53	888	1375	50
Wood blocks	number	3750	0	4226	4500
Film/documentary	permits	0	0	2	0
Communication sites	permits	31	34	20	11
Other structures	permits	25	29	20	12
Powerlines/cables/pipelines	kilometres	1052	394	534	533
Gravel/sand/rock	tonnes	42	51,722	0	0
Research	research permits	8	18	14	26
Maps sold to public	number	125	104	0	0

Appendix 10: Area and percentage of plantation established meeting effective stocking

Plantation type	PA (ha)	ES (%)	PA (ha)	ES (%)	PA (ha)	ES (%)	PA (ha)	ES (%)	PA (ha)	ES (%)	PA (ha)	ES (%)	PA (ha)	ES (%)	
	2005-06		2004-05		2003-04		2002-3002		2001-02		2000-01		1999-2000		
Eden															
Softwood planted forest	138	96%	0	na	357	53%	166	100%	156	nr	363	100%	316	100%	
Lower North East															
Hardwood planted forest	0	na	0	na	335	94%	550	100%	334	94%	668	nr	3392	95%	
Softwood planted forest	180	100%	0	na	0	na	0	na	0	na	83	100%	120	100%	
Upper North East															
Hardwood planted forest	525	100%	210	100%	435	100%	926	nr	0	na	3,392	95%	5,535	100%	
Softwood planted forest	409	100%	1297	100%	1,467	100%	742	100%	574	100%	204	96%	481	81%	
Southern															
Planted forest	3379	88%	3277	88%	2817	68%	3060	76%	na	na	na	na	na	Na	

PA = planted area

ES = effective stocking rate

Ha = hectares

na = not applicable

nr = not recorded

