

# ESFM PLAN

Ecologically Sustainable Forest Management  
Monaro Region NSW



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The information contained in this publication is based on knowledge and understanding at the time of writing (January 2008). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

# Minister's message

The State's planted and native forests provide a renewable resource for a wide range of consumer products. They foster economic and social development in regional NSW and are an important part of our natural and cultural heritage.

Forests NSW currently manages over 235,000 hectares of planted forests, securing its place as a major forest owner and manager in Australia. These forests absorb greenhouse gases from the atmosphere, provide food and shelter for native animals, maintain water quality and provide a supply of sustainable forest products to meet the needs of industry and the community.

The NSW Government is committed to giving our communities and industries confidence in the way in which State forests are managed today and for future generations. We want to be able to demonstrate that our State forests operate under world-class management systems.

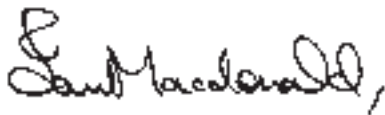
For our State owned planted forests, the Government has developed a strong legislative and regulatory framework through the *Plantations and Reafforestation Act 1999* and *Plantations and Reafforestation Code of Practice, 2001*. This

framework supports transparent, documented and fully accountable environmental and forest management systems, of which the Ecologically Sustainable Forest Management (ESFM) plans form a fundamental component.

These strategic ESFM plans have been subject to a process of public consultation and publicly document broad strategies, ecological principles, performance indicators and measurable outcomes for forest management.

The ESFM plans are supported by supplementary and operational plans that are tailored to accurately address local management issues such as fire, roads, weeds, pest animals and their related environmental impacts in each region.

The plans reflect a continuous improvement program based on adaptive management, compliance monitoring, corrective actions and management review that conform to ISO 14001 and Australian Forestry Standard requirements.

A handwritten signature in black ink, reading "Ian Macdonald".

**The Hon Ian Macdonald MLC**

Minister for Primary Industries  
Minister for Energy  
Minister for Mineral Resources  
Minister for State Development



# Ecologically Sustainable Management of State Forests

## Forests NSW Planted Forests – Monaro Region

### PLAN APPROVED AS OPERATIVE FROM 1/2/2008

The regional ESFM Plan for Monaro Region is the blueprint for achieving the principles of Ecologically Sustainable Forest Management. It sets out the broad strategies, performance indicators and measurable outcomes for forest management in the region over the next five years.

Formally, this plan covers the management, in terms of the *Forestry Act, 1916*, of plantations within the State forests and associated State forested lands and fulfils the requirements of Clause 5 of the *Forestry Regulation, 2004* under the Act.

Forests NSW is committed to promoting transparency and continual improvement of forest management. This Plan plays an integral role in the ISO 14001 certified Forests NSW Environmental Management System, in achieving a systematic and accountable approach to measuring, monitoring and managing performance related to ecological sustainability. Forests NSW success in promoting sustainability through transparency and continual improvement is formally recognised through independent third party certification under the Australian Forestry Certification Scheme's Australian Forestry Standard (AFS), and internationally by the Programme for the Endorsement of Forest Certification schemes (PEFC).

The Plan includes ten strategies to achieve objectives in key areas of forest management. The strategies cover:

1. Natural Heritage
2. Aboriginal Cultural Heritage
3. Non-Aboriginal Cultural Heritage
4. Nature Conservation
5. Forest Health
6. Sustainable Timber Supply
7. Economic Development
8. Social Development
9. Forestry Operations
10. Consultation, Monitoring and Reporting

This plan will be reviewed after its five-year lifespan and will remain in force until such time as it is replaced.

Forests NSW will use the Montreal criteria and indicators that have been adopted internationally and Australia-wide as a yardstick for measuring progress towards ecologically sustainable management of forests across all tenures.

Forests NSW will work in conjunction with its stakeholders including other agencies in order to achieve the goals of Ecologically Sustainable Forest Management.

MR NICK ROBERTS  
CHIEF EXECUTIVE OFFICER  
FORESTS NSW

DR RICHARD SHELDRAKE  
COMMISSIONER FOR FORESTS  
DIRECTOR-GENERAL  
NSW DEPARTMENT OF PRIMARY INDUSTRIES

## ESFM Plans in Forests NSW

Forests NSW is dedicated to Ecologically Sustainable Forest Management (ESFM) for current and future generations, to complement management on other tenures and to develop a sustainable forest industry. This is reflected in policies and directives such as the Commonwealth's National Forest Policy Statement (NFPS), the Montreal Criteria and Indicators, the *Forestry Act, 1916* and Forests NSW Environmental Policy, which states that Forests NSW will "achieve Ecologically Sustainable Forest Management".

Within the native forest regions there are ESFM plans for areas covered by Regional Forest Agreements (RFA). These agreements were reached between the Commonwealth and State governments after a Comprehensive Regional Assessment (CRA) process. The RFA areas of Upper North East, Lower North East, Southern (South Coast), Southern (Tumut), and Eden have had ESFM plans in place since 2005.

Other regions not covered by an RFA have either been assessed under State processes or are planned to be assessed in the near future.

The requirement for planted forest region ESFM plans evolved from a need to update the regional management plans for each of Forests NSW four planted forest regions to reflect more recent corporate policies and directives whilst maintaining its requirements under relevant Acts. The planted forest regions include Hume, Monaro, Macquarie and Northern.

## POLICY

Forests NSW will manage the State forested lands<sup>1</sup> of Monaro Region in an ecologically sustainable manner to deliver benefits to the community from all uses of the forest both now and for future generations while maintaining ecological processes and helping conserve biodiversity.

## BACKGROUND

The *National Forest Policy Statement* (NFPS) outlines agreed objectives and policies for the future of Australia's public and private forests. The goals of the NFPS include maintaining an extensive and permanent native forest estate while developing ecologically sustainable timber production, an internationally competitive timber products industry and an expanded commercial plantation resource.

As they developed the NFPS, the Commonwealth and State Governments considered:

- the many values that forests contain
- the suite of ecological processes in the forest that sustain life
- the function of forests in providing habitat for a diverse range of flora and fauna, and
- the contribution that forest based activities make to the economy and employment.

The NFPS recognises that plantations provide a wide range of environmental benefits to the community, and that their management should be based on sustainable management principles *Plantations for Australia: The 2020 vision (1997, 2001)* took its lead from the NFPS and states its overarching principle as the enhancement of regional growth and international competitiveness through the development and expansion of sustainable planted forests in regional Australia.

Regulatory regimes are embodied in approvals and licences issued pursuant to NSW environmental legislation including:

- *Forestry Act, 1916*
- *Plantations and Reafforestation Act, 1999*
- *Environmental Planning and Assessment Act, 1979*
- *National Parks and Wildlife Act, 1974*
- *Threatened Species Conservation Act, 1995*
- *Protection of the Environment Operations Act, 1997*
- *Fisheries Management Act, 1994, and*
- *Native Vegetation Act, 2003.*

This plan for Ecologically Sustainable Forest Management (ESFM) identifies the policies, objectives and targets which Forests NSW will use in the State forested lands of the Region for the five-year period 2008-2013. It defines how Forests NSW will deal with the identified values and comply with the regulatory regime, including attempts to incorporate an ecologically sustainable level of forest based activities, including timber production.

Forests NSW has identified 10 strategic areas in which to address ESFM, the details of which are summarised below.

## NATURAL HERITAGE

Forests NSW will identify, manage and contribute towards maintaining the full suite of natural heritage values that forests can provide across the landscape within Monaro Region for current and future generations.

Forests NSW will:

- implement a protected area strategy that recognises international, national state and regional conventions
- ensure native and planted forest activities and use are conducted in such a manner as to maintain habitat diversity across the landscape, safeguard ecological processes and complement the management of other forested lands within the region
- use comprehensive planning, training and operating systems to limit the risks of erosion and water quality degradation, and
- contribute to carbon sequestration through production of timber products and actively growing forest.

<sup>1</sup> State forested lands include State forests and other crown land tenures containing timber over which Forests NSW has management control on behalf of the Government of NSW.

## ABORIGINAL CULTURAL HERITAGE

Forests NSW will identify, protect and manage Aboriginal cultural heritage values on State forest in Monaro Region in cooperation with the Aboriginal community.

Forests NSW will:

- engage local Aboriginal people to create an awareness amongst Forests NSW staff about Aboriginal cultural heritage
- involve the Aboriginal community in the management of their cultural heritage through direct involvement in the inspection, discovery, monitoring and maintenance of Aboriginal sites
- ensure an equitable process for Aboriginal people to join the Forests NSW workforce and to capitalise on the skills of Aboriginal employees for the management of Aboriginal cultural issues
- at the request of Aboriginal communities, examine areas of State forest mutually suitable for joint management arrangements, and
- foster cooperative arrangements with the Aboriginal community for access to forest materials used for art and craft, food and medicine, and opportunities for cultural activity on traditional lands.

## NON-ABORIGINAL CULTURAL HERITAGE

Forests NSW will protect and manage non-Aboriginal cultural heritage values on State forest in cooperation with the community.

Forests NSW will:

- implement the agreed *Cultural Heritage Guidelines* to identify and protect sites
- under the *Heritage Act, 1977*, establish and maintain a Section 170 heritage register, and
- train relevant supervisory and operational staff in cultural heritage management.

## NATURE CONSERVATION

Forests NSW will contribute to nature conservation in State forests within Monaro Region through the protection and

active management of dedicated and informal reserves and protection of other values and areas by prescription and adaptive management processes.

Forests NSW will:

- implement the Forest Management Zoning system
- implement working plans for the Stingray Swamp Flora Reserve and Mount Tennyson Flora Reserve, and
- implement adaptive management systems at ecosystem/landscape scale.

## FOREST HEALTH

Forests NSW will maintain or enhance the health and productivity of forests to support nature conservation, timber production and other ecologically sustainable uses.

Forests NSW will:

- implement the silvicultural strategies outlined in the *Planted Forests Silviculture Manual*
- monitor and respond to insect and disease outbreaks and other factors that may impact on forest productivity
- implement regional management plans, including annual operational programs for:
  - pest animal control
  - weed control, and
  - fire management, and
- focus research and development programs to deliver improvements in production and conservation outcomes through better informed management.

## SUSTAINABLE TIMBER SUPPLY

Forests NSW will optimise the supply of timber products from planted forests within ecological and market constraints and within a long-term framework.

Forests NSW will:

- implement strategic inventory and growth monitoring programs to support modelling of current volumes and future yields of forest products

- review and refine timber estimation models and assumptions to improve the precision of available timber volume estimates
- monitor and report the quantity of all timber products harvested on an annual basis, and
- implement a timber supply strategy to meet timber supply commitments.

## ECONOMIC DEVELOPMENT

Forests NSW will, within an ecological framework, maximise economic returns from planted forests and their contribution to the economic well being of the communities within Monaro Region.

Forests NSW will:

- manage the planted forest estate to meet existing timber supply commitments and contracts and optimise returns on plantation investment
- maintain the capacity to cope with timber market opportunities as they arise including Forests NSW delivery of timber to mill door
- participate in the NSW Greenhouse Gas Abatement Scheme through the production of NSW Greenhouse Gas Abatement Certificates
- provide opportunities for grazing and apiculture within State forests
- encourage and facilitate ecologically and economically sound new business development opportunities based on forest values and uses, and
- continue to provide opportunities for appropriate tourism ventures, including Aboriginal cultural heritage, in conjunction with other interested parties.

## SOCIAL DEVELOPMENT

Forests NSW will, within ecological constraints and subject to using forests for other purposes, maximise its contribution to the social well being of the communities of Monaro Region.

Forests NSW will:

- continue to provide local and regional employment, both direct and through forest-based industries, especially timber products
- implement a regional road management plan that services timber harvesting, forest protection and management and community/non-timber uses
- promote ecologically sustainable forest recreation
- meet obligations to support hunting under the *Game and Feral Animal Control Act 2002*, and
- promote the use of State forests for natural resource education.

## FORESTRY OPERATIONS

Forests NSW will use adaptive management processes to ensure forestry operations within Monaro Region are ecologically sustainable and are conducted in a safe manner.

Forests NSW will:

- ensure that forest operations comply with relevant legislation, regulation and approvals
- implement working systems that will meet legal requirements and reduce the occurrence and potential severity of accidents to employees, forest workers and the general public
- annually develop programs for the key forest operations of timber harvesting, roadworks, weed and pest animal control, and fire hazard reduction burning
- develop and implement planning manuals and operational plans to facilitate a consistent approach to operational activities, and consideration of the relevant data sets
- implement a systematic training, accreditation, monitoring and audit program for forestry operations to measure compliance with the applicable safety and environmental standards, and
- ensure that all contractors and operators engaged in forestry operations are appropriately qualified through an accreditation and licensing system.



## Executive Summary

### CONSULTATION, MONITORING AND REPORTING STRATEGY

Forests NSW will undertake appropriate and systematic consultation, monitoring and reporting to achieve transparent and accountable professional forest management in the Monaro Region.

Forests NSW will:

- consult with relevant stakeholders on major strategic and operational issues including the plan of operations for timber harvesting
- using the Montreal criteria and indicators, monitor, review and report on the sustainability of forest management practices over time
- report on the maintenance of key regional forest values as part of its annual *Social, Environmental and Economic (Seeing) Report*, and
- prepare an annual *ESFM Report* that monitors progress to the objectives of the plan and assists in improvement of strategies.



Management Outcomes 2008-2013

ESFM



## ESFM STRATEGY

## OBJECTIVE

Natural heritage

Maintain the full suite of natural heritage values across the forest landscape

Aboriginal cultural heritage

Manage Aboriginal cultural heritage values and issues in cooperation with the Aboriginal community

Non-Aboriginal cultural heritage

Manage non-Aboriginal cultural heritage values in cooperation with local communities

Nature Conservation

Conserve natural and cultural heritage values within State forests

Forest health

Maintain or enhance the health and productivity of the forests

Sustainable timber supply

Supply timber in a long term, ecologically sustainable manner

Economic development

Maximise economic returns and contribute to the regional economy

Social development

Contribute to the social wellbeing of the regional community

Forestry operations

Ensure forestry operations are safe and ecologically sustainable

Consultation, monitoring and reporting

Ensure transparent and accountable, professional forest management

## OUTCOMES

- native forest ecosystems maintained
  - fragmentation of ecosystems by non-forest uses minimised
  - forest dwelling species of the region identified and contribution thus made to the maintenance of viable regional native flora and fauna populations
  - endangered species at risk from forestry operations identified and adaptive management applied
  - endangered ecological communities identified and protected
  - appropriate measures put in place to protect soil and water quality from potential adverse impacts of plantation operations
  - positive contribution made to Australia's net emission reduction program for carbon dioxide
- 
- Aboriginal community engaged about Aboriginal cultural heritage management
  - database of Aboriginal heritage sites maintained, while respecting the confidentiality of the Aboriginal community
  - Aboriginal heritage incorporated into forest management planning and environmental training programs
  - Forests NSW staff trained in Aboriginal cultural heritage awareness
  - Aboriginal people involved in delivering Aboriginal cultural heritage programs, identifying Aboriginal sites and liaising with Aboriginal communities
  - agreements for Aboriginal co-management of forests, and access for products and activities developed with local Aboriginal communities
- 
- non-Aboriginal heritage incorporated into forest management planning and environmental training programs
  - Forests NSW Section 170 Heritage and Conservation register maintained
  - Forests NSW staff and contractors trained in cultural heritage awareness
- 
- ecosystems and high conservation value old growth in the CAR reserve system on State forest protected from inappropriate planned disturbance
  - Forest Management Zoning applied across Monaro Region to secure areas identified for special management
  - essential components of endangered species habitat protected by adaptive management principles
- 
- weeds and animal pests managed through active, coordinated and cooperative programs
  - fire managed through integrated and cooperative fire hazard management and wildfire suppression programs
  - research and monitoring program implemented to foster ESFM
  - forest health monitored through regular surveys
- 
- net area of forest land available for timber production maintained or increased
  - forest productivity monitored through regular survey and modelling
  - cumulative removal of timber products maintained within ecologically sustainable levels
  - removal of non-timber products maintained within sustainable levels
  - forest health and productivity maintained through appropriate silviculture
  - long term supply agreements with industry met
- 
- product utilisation met through the effective use of log merchandising
  - new markets developed to utilise uncommitted products and increase value of these products
  - forest areas made available for commercial ventures in apiary, grazing and other appropriate uses where this does not conflict with ESFM
  - ecotourism in State forests fostered through partnerships with tourism and recreation businesses
  - Aboriginal cultural heritage tourism opportunities identified and facilitated in collaboration with the Aboriginal community
- 
- timber industry based employment opportunities provided
  - public and commercial access to the forest maintained
  - sustainable recreation in the forests encouraged and appropriate recreation facilities maintained for public enjoyment
  - environmental education fostered and facilitated
  - appropriate regional infrastructure provided for
- 
- environmental factors assessed at appropriate levels and results incorporated into operational plans
  - forestry operations implemented by appropriately trained and accredited staff
  - forestry operations appropriately monitored and audited by Forests NSW
  - safety risks from forest operations managed to ensure minimal risk of personal injury to Forests NSW employees, forest workers and the public
  - relevant legal and other regulatory requirements considered during the planning and implementation of forest operations
- 
- appropriate stakeholders consulted on strategic and operational issues
  - appropriate access by the public to planning data and operational schedules maintained
  - environmental assessment, planning and implementation of operations monitored and audited
  - social, environmental and economic outcomes reported to Parliament, regulators and the public

## POLICY

Forests NSW will identify, manage and contribute towards maintaining the full suite of natural heritage values that forests can provide across the landscape in Monaro Region for current and future generations.

## BACKGROUND

The *National Forest Policy Statement (1992)* (NFPS) identifies protection of the full range of forest ecosystems and other environmental values as being fundamental to ecological sustainability. This entails the maintenance of ecological processes, biodiversity and the protection of water quality. The Comprehensive, Adequate and Representative (CAR) reserve system seeks to achieve this.

The NFPS also recognises that plantations provide a wide range of environmental benefits to the community, and that their management should be based on sustainable management techniques. *Plantations for Australia: The 2020 vision (1997, 2001)* which took its lead from the NFPS, states its overarching principle as the enhancement of regional growth and international competitiveness through a sustainable increase in the plantation resource. It sets a notional target of trebling the area of commercial tree crops by 2020 from a base of 1.1 million hectares (ha) in 1997.

As part of implementing the NFPS, governments undertook Comprehensive Regional Assessments (CRA) of the environment, heritage, economic and social values of the native forests on public lands. It was the first time that a coordinated approach had been taken to assess these values across land tenures. Areas zoned for plantation by Forests NSW were considered as unavailable to contribute to protection of conservation values, and were therefore not part of the CRA process. These assessments were used as the basis for negotiation of the southern NSW and Eden regional forest agreements (RFA). The southern RFA region was divided into sub-regions, and the South Coast Sub-region is the relevant one in this Plan.

The CAR reserve system, and complementary management of adjoining forest areas, aims to conserve old-growth and wilderness and provide for forest

biodiversity. This national reserve system is comprised of dedicated and informal reserves and areas where the special values can be protected by prescription. The native forests adjoining Monaro Region are managed under the *Integrated Forestry Operations Approval for Southern and Eden Regions* (IFOA).

Planted forests were favoured as a method for improving the productivity and utility of the forest estate in NSW from the early 1900's because of their greater growth rates and more uniform wood quality. Species trial plantings occurred in Monaro Region in 1916 and planting of exotic species to replace "unproductive" native forest commenced in the 1920's. Between 1966 and 1977, the planted forest estate expanded rapidly as New South Wales participated in the Commonwealth Softwood Agreement. The planted forests estate also extended onto private lands with the introduction of the Farm Woodlot Loan Scheme.

From about 1982 Forests NSW adopted a policy to establish planted forests only on substantially cleared agricultural land. By 1990 this policy had extended to excluding any clearing of significant patches of native vegetation. In recent years Forests NSW has encouraged further private investment in the plantation estate by facilitating carbon trading and establishing and managing planted forests on behalf of other parties.

As well as involvement in the CRA process, the NSW Government has developed a framework of environmental legislation for plantation operations. Plantations in NSW are regulated by the *Plantation and Reafforestation Act, 1999 (P&R Act)* and the *Plantation and Reafforestation (Code) Regulation, 2001 (P&R Code)*. This Act aims to promote plantation establishment and contains standards for the establishment, management and harvesting of the trees, and applies equally to private and government owned plantations.

Forests NSW manages approximately 39,550 ha of planted State forests within the Monaro Region under this Ecologically Sustainable Forest Management (ESFM) Plan.

## BIODIVERSITY

Biodiversity<sup>1</sup> is broadly measured in terms of genetics, species and ecosystems. JANIS<sup>2</sup> formulated criteria, identifying forest ecosystems as a surrogate for biodiversity. These criteria were used to identify the extent of protection that would be necessary for a CAR reserve system across the region's native forests.

Forests are dynamic systems, with biodiversity constantly changing as the forest responds to natural forces such as storms and fire.

Forests NSW is committed to the principles of ESFM and will contribute to the management of biodiversity across the forested landscape<sup>3</sup>. Forests NSW will use adaptive management principles (see *Adaptive Management* and *Part 9: Forestry Operations*) and actions within State forests to complement the management of the CAR reserve system.

Planted forests augment native forests by providing forage, shelter or nesting for some native species. Research has shown that in tableland areas planted forests have greater diversity than the cleared lands that they are replacing. Planted forests may provide key niches for some species to thrive.

Forests NSW has developed the Forest Management Zoning (FMZ) system<sup>4</sup> (see *Part 4: Nature Conservation*), forest practices codes<sup>5</sup> for plantation establishment, timber harvesting and road works and operational plans which, together with the regulatory framework, will ensure that biodiversity is protected during forestry operations within State forests. Additionally, Forests NSW will:

- manage dedicated and informal reserves using approved plans and create, where appropriate, special management zones (see *Part 4: Nature Conservation*)
- manage special prescription areas through the provisions of the FMZ system (see *Part 4: Nature Conservation*)
- manage native vegetation under the provisions of the *Plantation and Reafforestation Act, 1999* ensuring no broadscale clearing of land for plantation establishment
- use the results of best practice ecological survey techniques of flora, fauna, fish and heritage values to inform and be incorporated into operational plans (see *Part 9: Forestry Operations*)
- develop regional pest animal and weed plans and local annual programs incorporating provisions of threat abatement plans developed under the *Threatened Species Conservation Act, 1995*, (see *Part 5: Forest Health*)
- develop a regional fire management plan, incorporating strategies for ecosystem and forest fuel management and fire suppression, and field operational plans for fuel hazard reduction burning to complement the strategic corporate fire management plan (see *Part 5: Forest Health*)
- develop a plan for the grazing of domestic animals in retained native vegetation that recognises and takes account of ecological impacts (see *Part 7: Economic Development*)
- monitor and report biodiversity conservation performance to Montreal Criteria standard<sup>6</sup>, and monitor operational implementation compliance as they apply to plantations (see *Part 10: Consultation, Monitoring and Reporting*)
- train and, where necessary, accredit staff to a standard necessary to perform their duties
- undertake cooperative research to refine the standard of biodiversity conservation performance reporting, and
- cooperate with other government agencies, neighbours and community organisations in the delivery of coordinated land management planning instruments that affect biodiversity values in forested landscapes.

<sup>1</sup> Biodiversity refers to all animal, plant and microbial life forms, the genes they contain and the ecosystems and ecological processes of which they form a part.

<sup>2</sup> JANIS is an acronym for the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee who established the *Nationally Agreed Criteria for the Establishment of a Comprehensive Adequate and Representative Reserve System*.

<sup>3</sup> The *NSW biodiversity strategy* identifies the CRA/RFA program resulting in CAR reserves as one of the key initiatives undertaken in NSW to protect core areas of biodiversity. It also identifies ESFM as a means of protecting biodiversity on all forested tenures and which would include species recovery planning and pest management programs.

<sup>4</sup> The Forest Management Zoning system is a map-based identification of management intent of Forests NSW and is fully described in Operational Circular 99/10.

<sup>5</sup> Codes of Practice have been developed adopting the *Forest practices related to timber production in native forests and plantations: National principles* as a guide.

<sup>6</sup> See *Criteria, Targets and Monitoring Processes of Ecologically Sustainable Forest Management for the Southern and Eden RFA regions*.

## SOIL, NUTRIENTS AND WATER

Forests NSW recognises that soil is the basis for forest ecosystem productivity and that the interaction between soils and plants is a critical component of the nutrient and water cycles.

Long-term soil formation processes will be assured by maintaining forest cover and implementing soil conservation measures to maintain soil depth.

Vegetation intercepts rainfall and increases infiltration into soil, reducing overland flows, flooding and potential for soil loss. Movement of water downward in the soil leaches nutrients from topsoils, reducing fertility.

Deep-rooted perennial vegetation returns nutrients to top soils and reverses the degrading effect of leaching. Timber harvesting removes nutrient poor timber but leaves nutrient rich foliage on the forest floor. Mineralisation and atmospheric contributions enhance the nutrient balance.

Some soils become unstable when they become saturated. Mass movement of the soil regolith can occur and appears to be more prevalent on cleared lands than on forested lands.

Plants absorbing water at depth in the soil ensure that water flows down through the soil preventing the upward movement and concentration of dissolved salts at the soil surface. Excess water moves through the soil to maintain base flows in streams and to recharge ground water systems.

Fast growing planted forests act as water pumps, absorbing water at depth and releasing it to the atmosphere more efficiently than most other types of vegetation. This completes the water cycle and helps prevent salinity but may have some impact on the amount of water that enters stream and ground water systems.

The quantity and quality of waters entering streams is important for maintaining aquatic ecosystems and, in some cases, providing water supply for domestic consumption, agricultural use and power generation. Pollution in the form of excessive nutrients, gross particulate matter or chemicals should be avoided and a reliable flow of water maintained.

High intensity fires have the potential to remove large quantities of nutrients from the system, remove protective

cover of the mineral soil, destroy living organisms, consume organic matter in surface soils, permanently change chemical properties of soil particles and to impact on soil structure. Increased overland flows after high intensity fire cause accelerated erosion, pick up large quantities of ash and sediment which then dramatically changes the aquatic environments of forest streams.

To mitigate soil erosion and prevent water pollution during forestry operations, Forests NSW aims to:

- minimise ground disturbance
- limit the distance of overland flows over disturbed areas
- break the continuity between disturbance and concentrated flow channels
- delay run-off, thereby promoting infiltration of rainfall
- replant areas that have been clear felled according to the provisions of the *P&R Code*, and
- reforest areas of cleared land anchoring soils, reducing soil saturation and moderating mass movement.

Forests NSW will continue to conserve soil and protect water quality by implementing the collective provisions of:

- the Forest Practices Code for:
  - timber harvesting in plantations
  - plantation establishment and maintenance, and
  - forest roads and fire trails, and
- the *P&R Code*.

In addition, Forests NSW will use adaptive management principles to continuously improve planning and field implementation and will:

- develop a regional road management plan incorporating a measure of environmental risk assessment, priorities for road work and local annual program development guidelines (see *Part 8: Social Development*)
- incorporate soil survey data into integrated operational planning, particularly for harvesting and site preparation as per the *P&R Code* (see *Part 9: Forestry Operations*)

## Natural Heritage

- monitor and report operational implementation of soil conservation and water quality maintenance measures (Compliance monitoring program)
- seek specialist soil conservationist advice on field practice
- research the effects of planted forest establishment, road works, timber harvesting and fire on water quality eg Canobolas and Red Hill water quality monitoring and the Cooperative Research Centre (CRC) for Forest Hydrology
- train and accredit, where necessary, staff and contractors involved in site establishment, road works and harvesting (*see Part 9: Forestry Operations*)
- provide copies of plans, codes and manuals to all operators and supervisors of operations that disturb soil, and
- manage native forest fuel levels to minimise catastrophic wildfire damage (*see Part 5: Forest Health*).

### LANDSCAPE

Planted forests form a mosaic with native forests and cleared and semi-cleared lands of the Eden and Southern Regions.

There are 39,550 ha (as at 2004) of plantation managed by Forests NSW in consolidated patches at Bombala, with two small disjunct plantations near Captains Flat and Moss Vale. Additionally there are about 18,790 ha of plantings on private lands, mostly adjacent to or in close proximity to Forest NSW plantings.

Within the State owned plantations, areas of remnant vegetation have been retained, often associated with major drainage corridors or where biodiversity values were historically identified. *P&R Code* details the permissible requirements for the clearing of native vegetation. Informal reserves of native forest and areas protected by prescription within the area that Monaro Region manages comprise a total area of 2,323 ha.

Thinning and clear felling are the silvicultural techniques used to maximise growth potential and yield in planted forests. Softwood plantations are thinned at approximately 14 and 22 years, and clearfelled at age 30-35 years.

These operations also add to the structural diversity of the planted forest estate.

The aesthetic impact of timber harvesting, although relatively short term, is significant and will be considered during operational planning. Considerations include windthrow, environmental impacts of alternatives, and productivity criteria related to age, stand characteristics and markets. Where it is appropriate, areas will be classified under the FMZ system to protect aesthetic values<sup>7</sup> and appropriate management conditions developed.

Forests NSW will maintain a long-term continuous forest cover in Monaro Region by:

- applying the FMZ classification in sensitive areas and incorporating this into operational plans
- replanting clear felled areas in accordance with the *P&R Code*
- increasing the planted forest estate by reforestation previously cleared land under the provisions of the *P&R Code*, and
- maintaining corridors linking reserves and threatened species habitat.

Formal reserves of native State forest are covered in the Eden and South Coast Sub- region ESFM plans. On private lands, landscape connectivity is assured through application of the *Native Vegetation Act, 2003*.

### CARBON CYCLE

Photosynthesis captures the solar energy required to sustain the biological world. The vertical structure of forests makes them a most efficient synthesiser of energy, water and atmospheric carbon to produce oxygen and sugars. Burning and decomposition use oxygen to produce energy and release carbon back into the atmosphere to complete the carbon cycle.

Wildfire under extreme conditions occurs periodically and is estimated to contribute up to 25% of Australia's total annual carbon emissions. Hazard reduction burning consumes

<sup>7</sup> Aesthetic landscape areas are classified as FMZ 3B in the Forest Management Zoning system.

only a small proportion of the available biomass and returns a limited amount of carbon to the atmosphere each year.

Decomposition of plant and animal matter in mature and over-mature forests adds to the carbon dioxide produced in normal growth processes such that there is no net impact on oxygen and carbon dioxide levels in the atmosphere.

Rates of decomposition in planted forests are relatively low, resulting in a net accumulation of about 4.5 tonnes per hectare per annum of carbon in the tissues of the trees. The actively growing forest becomes a sink for atmospheric carbon. This cycle is prolonged if the timber containing carbon and obtained from regrowth forests is then put into service.

Global communities are becoming increasingly concerned about the increase in the proportion of greenhouse gases, including carbon dioxide<sup>8</sup>, in the atmosphere, global warming and climate change. Utilisation of fossil fuels has released part of the ancient sinks for carbon, converting it to atmospheric carbon at a rate far greater than would naturally occur. Clearing of forests for agricultural production has also contributed to elevated carbon dioxide levels in the atmosphere.

In negotiating the Kyoto protocol, the Australian government agreed that by 2012 it would contain Australia's net level of greenhouse gas emissions to 108% of its 1990 levels. On ratification of the protocol in 2007, the Australian government set targets to reduce greenhouse gas emissions by 60% on 2000 levels by 2050, establish a national emissions trading scheme by 2010, and a 20% target for renewable energy production by 2020. Together with efficiencies in energy production and consumption, sequestration of atmospheric carbon into forest sinks, particularly plantations established on previously cleared agricultural land, was identified as part of the net emission reduction equation.

Internationally, planted forest thinning, harvesting residue and sawmill waste are becoming an increasingly important source of electrical power generation. Replacement of fossil fuels with biomass will preserve the ancient carbon sinks and have no net impact on atmospheric carbon levels.

<sup>8</sup> The Rio Conference on climate change identified carbon dioxide as one of the greenhouse gases responsible for global warming.

In managing forests sustainably for timber and other products, Forests NSW will maintain the carbon cycle and contribute to Australia's net emission reduction program by:

- promoting planted forest establishment on previously cleared lands (see *Part 6: Sustainable Timber Supply*)
- promoting carbon trading and private investment in further establishment of planted forest (see *Part 7: Economic Development*)
- promoting the use of planted forest thinnings as bio-fuels to concentrate growth on fewer stems to accelerate high quality sawlog production (see *Part 7: Economic Development*)
- preventing land-use change to non forest
- reducing the potential for large intense wild fires that generate greenhouse gases
- promoting the use and maximising the production of harvested timber products, which enable captured carbon to be stored long term, and
- supporting the CRC for Greenhouse Accounting to research carbon sequestration in plantation and regrowth forests.

## ADAPTIVE MANAGEMENT

The adaptive management process used by Forests NSW is the basis for ESFM and continuous improvement.

The planning process identifies desired outcomes, integrates survey results and new information, applies pre-determined ecological framework constraints and documents amended outcomes in operational plans.

During operations, site-specific conditions are continually assessed, results recorded, the appropriateness of operational conditions reviewed and plans amended where necessary.

Operational auditing monitors compliance with plan conditions and, where non-compliance occurs, assesses environmental harm, details repair works where necessary, the cause of non-compliance, whether sanctions are necessary and how the non-compliance can be avoided in future operations.



## Natural Heritage

Results are reported and incorporated into the planning and implementation processes.

### MONITORING AND REPORTING

Only some of the natural heritage values are easily quantified.

Management of natural heritage values is monitored and reported using the Montreal Criteria and Indicators identified in the CRA and as agreed in the Eden and Southern RFAs (*see Part 10: Consultation, Monitoring and Reporting*).

Forests NSW has adopted a number of additional criteria to monitor environmental performance in forest management and reports annually in social, environmental and economic fields (*see Part 10: Consultation, Monitoring and Reporting*).



## Part 2: Aboriginal Cultural Heritage

### POLICY

Forests NSW will identify protect and manage Aboriginal cultural heritage values on State forests in Monaro Region in cooperation with the Aboriginal community.

### BACKGROUND

The *National Forest Policy Statement* identified Aboriginal cultural heritage as one of the many values contained in forests and the NSW Government (2000) has recognised that “Aboriginal people are the custodians of their own culture”. The *National Indigenous Forestry Strategy, 2005* proposes that indigenous communities participate in building competitive and ecologically sustainable forest industries. This ESFM plan shows a commitment to its objectives.

Before occupation by non-Aboriginals, people of the Ngarigo, Yuin (Bombala), Ngunnawal (Captains Flat) and Gundungarra (Moss Vale) Aboriginal nations inhabited parts of the landscape now managed by Monaro Region. They maintained a society with complex rules and a lifestyle designed to ensure a sustained existence in the landscape.

Living within defined geographic boundaries ensured social interaction and the availability of food and shelter. The regional landscape has physical evidence of ceremonial and meeting places, and teaching, initiation and occupation sites in the form of caves, art, rock carvings, camps, stone artefacts, and carved trees.

Settlement by non-Aboriginals forced Aboriginal people from their traditional areas, disrupting their social structure, values and traditional lifestyle.

The spiritual connection between Aboriginal people and the natural and cultural values on State forests is recognised and acknowledged. State forests offer an opportunity to re-establish links with the land and an avenue for reconciliation.<sup>1</sup>

Although creation of the planted forest estate has formed part of an extensive modification of the regional landscape, Monaro Region’s forests still have cultural, environmental and economic value to the Aboriginal people. More than

40 sites of significance to Aboriginal cultural heritage have been identified within or adjacent to the planted forests of the Region.

### COMMITMENT TO ABORIGINAL PEOPLE

Forests NSW makes a commitment to consult with Aboriginal people to ensure:

- appropriate Aboriginal cultural heritage awareness training for Forests NSW staff
- involvement in the development of policy concerning the management of Aboriginal values and interests in State forests
- identification and management of Aboriginal cultural heritage sites, places and resources
- access to land for cultural purposes which may include hunting, gathering and occupation
- identification of culturally appropriate co-management and commercial joint venture opportunities, and
- identification of Aboriginal employment opportunities in cultural and natural resource management activities.

Forests NSW recognises that more than one group may have connections and rights to particular areas. Forests NSW will continue to liaise with relevant Aboriginal community groups throughout Monaro Region including Local and Regional Aboriginal Land Councils, native title claimants, traditional owners, Elders and Aboriginal corporations.

Furthermore, Forests NSW recognises that Aboriginal interests and values are best addressed when identified by members of the relevant Aboriginal communities and considered with appropriate representatives. Therefore Forests NSW will:

- encourage participation by the Aboriginal community in the management of their cultural heritage through direct involvement in the inspection, monitoring, and the maintenance of Aboriginal sites
- involve local Aboriginal people in training relevant Forests NSW staff in recognition and management of significant Aboriginal heritage values and

<sup>1</sup> As part of the Reconciliation process the NSW Government has acknowledged past injustices, said “sorry” and identified a joint way forward for the Aboriginal and non-Aboriginal community.

- follow procedures within the *Native Title Act, 1993* (Commonwealth).

## BASIS FOR MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE AND INTERESTS

Forests NSW is required to manage cultural heritage values on State forest under the provisions of:

- the *National Parks and Wildlife Act, 1974*, which provides statutory protection for all Aboriginal objects and for all Aboriginal places, and
- the *Plantations and Reafforestation Regulation (P&R Code), 2001*, and
- the *Native Title Act, 1993* (Commonwealth).

Cultural heritage management will be consistent with the *Cultural Heritage Guidelines* within the *Integrated Forestry Operations Approvals* (IFOA) for Southern and Eden regions. These *Guidelines* incorporate the following principles:

- use of regionally based management mechanisms, such as Forest Management Zoning (FMZ) (see *Part 4: Nature Conservation*)
- recognition of cultural heritage management as a key responsibility of forest management agencies
- involvement of appropriate Aboriginal communities
- sharing of knowledge and skills development
- engaging relevant Aboriginal groups in the forest management process, and
- use of performance indicators to measure progress.

Forests NSW has developed, in consultation with the Aboriginal community, *Operational Guidelines for Aboriginal Cultural Heritage Management*, incorporating these principles at an operational level.

## INFORMATION MANAGEMENT

NSW Department of Environment and Climate Change (DECC) maintains the Aboriginal Heritage Information

Management System (AHIMS). Forests NSW and DECC have a *Memorandum of Understanding* for the supply of information relevant to State forests and which includes protocols for handling, distribution and use of data.

Forests NSW recognises that Aboriginal cultural heritage site information belongs to the Aboriginal community. Forests NSW will advise people seeking access to Aboriginal heritage information to approach the relevant Aboriginal community. Where requested, Forests NSW will maintain confidential regional Aboriginal heritage data on behalf of the Aboriginal community.

Forests NSW is required by the *National Parks and Wildlife Act, 1974* to provide DECC with information about new Aboriginal heritage sites. However, where an Aboriginal group indicates a confidentiality issue and the Aboriginal community is not prepared or is unwilling to submit information to the DECC register, only the contact details of the relevant Aboriginal group will be provided to DECC.

## FIELD PROTECTION OF ABORIGINAL CULTURAL HERITAGE VALUES

Forests NSW will use the *Operational Guidelines for Aboriginal Cultural Heritage Management* in the planning and implementation of field operations.

Forests NSW will:

- implement Forests NSW Aboriginal Cultural Heritage Awareness program for all employees
- identify and consider known information by consulting sites registers, the FMZ system, and local Aboriginal communities
- where necessary, undertake pre-operational Aboriginal cultural heritage surveys using representatives of the local Aboriginal community to identify and assess Aboriginal sites
- maintain buffers around Aboriginal sites as required under the *P&R Code*
- develop, in conjunction with Aboriginal community, site-specific management prescriptions to protect cultural heritage values

- incorporate prescriptions into operational plans
- monitor adherence to prescriptions during forestry operations
- cease operations in proximity to any site discovered during an operation. The nature and significance of the site will be determined in conjunction with the Aboriginal community and suitable measures will be taken to protect sites
- where a site can not be protected during an operation, liaise with the Aboriginal community on the nature of the operation and the management of the site and seek and obtain any required approvals, eg under Section 90 of the *National Parks and Wildlife Act, 1974*, prior to commencing works, and
- ensure all Forests NSW staff supervising operations are trained in Aboriginal cultural heritage responsibilities.

## CO-MANAGEMENT AND JOINT VENTURE ARRANGEMENTS<sup>2</sup>

To ensure that Aboriginal cultural heritage values are maintained in the landscape Forests NSW will review forest areas, at the request of the local Aboriginal community, to identify those with potential for co-management.

Forests NSW and local Aboriginal communities will progressively negotiate cooperative arrangements that ensure access and enable Aboriginal people to be involved in the strategic management of these areas.

Forests NSW also will explore with Aboriginal communities potential opportunities for joint ventures. Proposals that provide economic benefits to Aboriginal people or promote recognition, awareness and respect for Aboriginal culture will be most favoured.

## ABORIGINAL CULTURAL TOURISM

Forests NSW recognises the potential value of cultural tourism for Aboriginal communities and the benefit this can play in better informing people about Aboriginal culture. It is

also recognised that inappropriate tourism may damage the physical or cultural values of Aboriginal sites.

Any proposals for developing tourism based on Aboriginal sites on State forest will be assessed in consultation with the relevant Aboriginal communities. Their consent must be granted prior to the establishment of any venture. Forests NSW will cooperate with Aboriginal communities and other tourism proponents to facilitate Aboriginal cultural heritage tourism opportunities, to develop appropriate interpretation and to respect sensitivities such as gender-specific sites.

## ABORIGINAL USE OF FOREST RESOURCES

Forests NSW will cooperate with local Aboriginal communities and DECC to develop a joint strategy for Aboriginal community access to resources on native forests for continuing Aboriginal cultural heritage practices. These may include, but not be limited to, materials for art and craft purposes, food sources, medicine, access to domestic firewood and opportunities for traditional use and cultural activity.

Areas of State forest that may be used for Aboriginal education and specific community activities, in accordance with traditional Aboriginal practices, will be identified and agreed upon by negotiation with Forests NSW.

Commercial use of products for social and economic development will be encouraged where this is consistent with other forest management objectives.

## EMPLOYMENT AND TRAINING

Where desired by the Aboriginal community, Forests NSW will consult and explore opportunities for development of mutually beneficial land management training and work experience program. This has potential for the Aboriginal community to improve knowledge about Forests NSW and gain skills and experience in forestry and natural resource management. It will provide an opportunity for Forests NSW to appreciate and understand issues affecting local Aboriginal communities and to widen the employment base available for forest management activities.

<sup>2</sup> The *Forest Agreements for Southern and Eden regions* identifies the areas that Forests NSW should address to ensure greater Aboriginal involvement in management of Aboriginal culture and natural resources.

## Aboriginal Cultural Heritage

### MEASURING PERFORMANCE

Forests NSW will use performance indicators derived from *Operational Guidelines for Aboriginal Cultural Heritage Management* and those adopted for the *Social, Environmental and Economic Report*.

Forests NSW performance in the management and protection of cultural heritage will be reported annually.

Forests NSW will undertake formal reviews of policies, procedures and processes relating to Aboriginal cultural heritage as part of the ongoing review of the Forests NSW Environmental Management System (see *Part 9: Forestry Operations*). Such reviews will include participation by the Aboriginal community and regulatory agencies.



# Part 3: Non-Aboriginal Cultural Heritage

## POLICY

Forests NSW will protect and manage non-Aboriginal cultural heritage values on State forest in Monaro Region in cooperation with the community.

## BACKGROUND

Non-Aboriginal heritage items and places are those with heritage significance that the community wants to keep for future generations. They may be important historically, for reasons of community or technological development, land and resource utilisation or aesthetics and may include landscape or topographical features.

The Bombala area was first penetrated by Europeans in 1834 when Johan Lhotsky led an expedition to the Monaro Plains. In 1839 Angus McMillan, from Currawong Station on the Monaro Plains, explored a route through to Omeo in Victoria passing through the area that is now Bombala. The railway reached Bombala in 1921, vastly improving the transport link to Sydney. By the 1840's most of Monaro was under grazing lease.

The first plantations in the Bombala area were established at Nalbaugh in 1927 and in Bondi in 1928. Planting continued until 1938 as part of arrangements with the Prisons Department, who established a prison farm at Bondi. Planting did not resume until 1959.

The Moss Vale area was opened up between 1798 and 1819 and the area settled by 1820. Plantation establishment commenced in 1919 but was suspended in 1935, not to recommence until 1955.

Tallaganda forest, near Captains Flat, was opened up in the 1830s for native hardwood timber, with the first mills established in 1875. Plantations were of more recent origin having been established between 1968 and 1981.

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects places listed on the World Heritage and National Heritage lists as well as enhancing the management and protection of Australia's heritage places. There are no places that have been listed as important to all peoples of the world or of outstanding Australian significance within Monaro Region.

The Register of the National Estate is Australia's national inventory of natural, cultural and indigenous places that are special to Australians and worth keeping for the future. This register is maintained by the Australian Heritage Council. Within Monaro Region, there is one site listed on the National Estate Register. This is the Woolingubrah Inn located in the Bombala plantations.

Within NSW, heritage conservation is addressed through the *Heritage Act, 1977*. Heritage items are listed on the State Heritage Inventory (SHI). Items listed in the SHI database are assessed against significance criteria for listing on Forests NSW Heritage and Conservation Register, pursuant to Section 170 of the *NSW Heritage Act, 1970*.

Those items considered to be of special significance to all NSW are nominated for listing on the State Heritage Register (SHR). There are no SHR listings from the State forests of Monaro Region at the time of writing.

## CULTURAL HERITAGE MANAGEMENT

Forests NSW is required to manage non-Aboriginal cultural heritage values on State forests under the provisions of:

- the *Heritage Act, 1977*, which protects the State's natural and cultural heritage, including archaeological remains, and
- the *Plantations and Reafforestation Act, 1999*.

Cultural heritage management will be consistent with the principles contained in *Cultural Heritage Guidelines* within the *Integrated Forest Operations Approvals (IFOA)* for Southern and Eden regions. These guidelines have been developed in consultation with Department of Environment and Climate Change (DECC) and the NSW Heritage Office and incorporate the following principles:

- use of regionally based management mechanisms, such as Forest Management Zoning (FMZ) (see *Part 4: Nature Conservation*)
- implementation of legislative systems and controls, in particular the *Heritage Act, 1977*
- acceptance that cultural heritage management is a key responsibility of forest management agencies

- involvement of appropriate communities
- sharing of knowledge and skills development
- engaging stakeholders in the forest management process, and
- use of performance indicators to measure progress.

*Cultural Heritage Guidelines* draw on established heritage practices described in the heritage literature applicable throughout both NSW and Australia.

The guidelines incorporate the identification, assessment and management of cultural heritage and the performance indicators to report the effectiveness of heritage management.

## MANAGEMENT STRATEGIES

Forests NSW will ensure that non-Aboriginal cultural heritage is identified, protected and managed by:

- maintaining the SHI database and linking it to spatial representation in Forests NSW Geographic Information System (GIS)
- reviewing the SHI database for significance and listing, where appropriate, on the Section 170 Register
- incorporating field inspection results into operational planning
- sharing cultural heritage information with appropriate stakeholders and involving them in management planning
- interpreting cultural heritage sites and values for education and other purposes
- developing management plans for sites where necessary under the *Heritage Act, 1977*, and
- training all employees whose work may create a potential impact on cultural heritage sites.

## INFORMATION MANAGEMENT

Forests NSW will use GIS to manage site specific non-Aboriginal cultural heritage information.

Information capture will involve verification, recording and assessing records from past assessment processes, where available, and from ongoing surveys for inclusion on the SHI database. These records will then be further reviewed against Heritage Council criteria for inclusion and updating of the Heritage and Conservation Register maintained by Forests NSW under Section 170 of the *Heritage Act, 1977*.

Forests NSW will ensure that sites of potential State significance will be brought to the attention of the Heritage Council for listing on the SHR.

## OPERATIONAL PROTECTION OF CULTURAL HERITAGE

To ensure protection of non-Aboriginal cultural heritage sites in the field, Forests NSW will use adaptive management principles and will:

- identify and consider known information by consulting sites registers and the FMZ system
- develop site specific management prescriptions to protect non-Aboriginal cultural heritage values
- incorporate the conditions of the *Plantations and Reafforestation Regulation (P&R Code), 2001* into operational plans
- monitor prescription adherence during operational implementation, and
- cease operations in the area if a site is uncovered while the operation is in progress. The nature and significance of the site will be determined and suitable measures will be taken to protect significant sites.

## MONITORING AND REPORTING

Forests NSW will use performance indicators derived from the *Cultural Heritage Guidelines* and those adopted for the *Social, Environmental and Economic (Seeing) Report*.

Forests NSW performance in the management and protection of cultural heritage will be reported annually.

### POLICY

Forests NSW will contribute to nature conservation on State forests in Monaro Region through the protection and active management of dedicated and informal reserves and protection of other values and areas by prescription and adaptive management processes.

### BACKGROUND

The *National Forest Policy Statement (NFPS)* seeks to maintain a permanent native forest estate and protect nature conservation values in forests.

For plantations, one goal of the NFPS is to provide an additional, reliable and high-quality timber resource for industry. However, planted forests also assist in nature conservation by supporting a biodiversity greater than the cleared areas they replace and by satisfying demand for timber.

Planted forests also contain areas of native forest that have been retained for conservation purposes or for operational reasons that provide nature conservation benefits.

Within the wider landscape, there has been a Comprehensive Regional Assessment (CRA) of natural and cultural heritage values of the native forests on public lands. Areas zoned as plantation were not part of this process. The JANIS criteria were used to consider forest biodiversity, old growth, wilderness, cultural heritage and other specific forest values and design a Comprehensive, Adequate and Representative (CAR) reserve system.

These assessments were used as the basis for negotiation of the Southern and Eden Regional Forest Agreements (RFA). The RFAs delivered conservation of the forests through the provision of a CAR reserve system, and provided a basis for an internationally competitive timber industry.

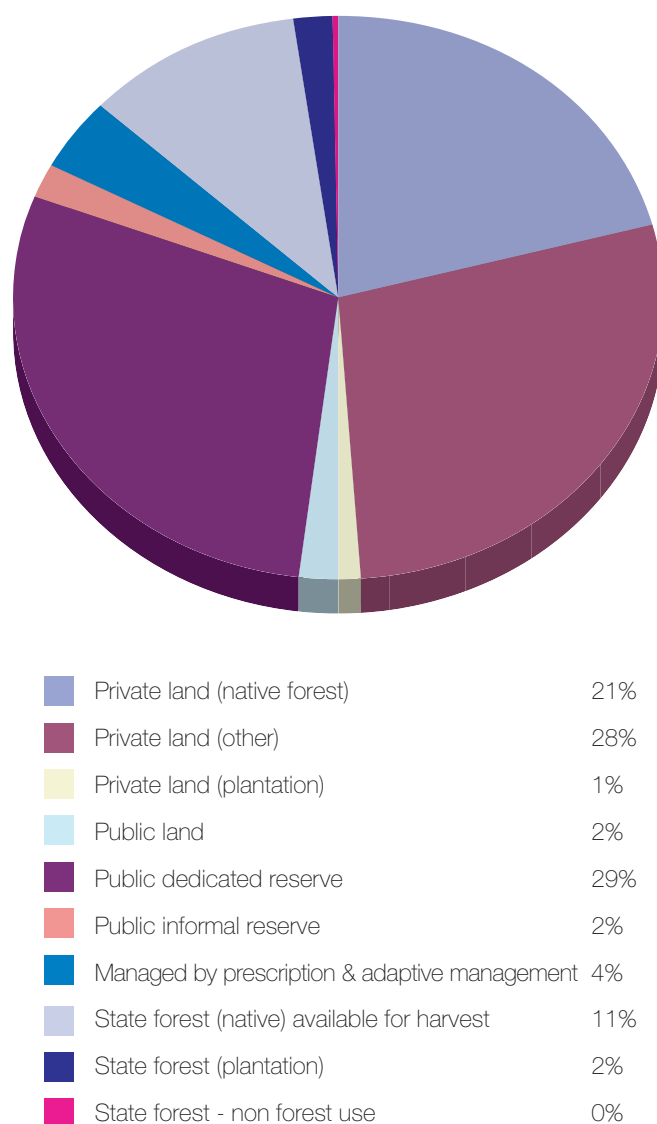
The CAR reserve system comprises dedicated reserves, informal reserves and values protected by prescription.

Monaro Region lies within the South Coast sub-Region of the Southern RFA and also within Eden Region, covering approximately 2.77 million ha. Of this area 1.78 million ha (64%) remains under native forest cover. Since 1.3 million

ha (48%) of the forested area is in public ownership, the native forest estate will continue to be extensive. Publicly owned forests will be complemented by management of forests on private lands under the *Native Vegetation Act, 2003*.

The forested proportion and tenure of land within Monaro Region is illustrated in *Figure 1* and *Table 1*.

*Figure 1 – Land tenure across Monaro Region*





Dedicated reserves comprise national parks, nature reserves and, on State forest, flora reserves. Flora reserves are equivalent to International Union of Conservation and Nature (IUCN) Protected Area categories I, II, III or IV and are classified as Forest Management Zone (FMZ) 1 – Special Protection<sup>1</sup>.

Informal reserves include Crown reserves (*Crown Lands Act, 1989*), State recreation areas, and conservation reserves. On State forests they comprise FMZ 2 – Special Management areas greater than 40 ha and having a minimum width of 200 m or Special Management Zones where they have been created under Clause 21A of the *Forestry Act, 1916*. All are equivalent to IUCN Protected Area categories II, III, IV or VI.

Values protected by prescription include FMZ 3A - Harvesting Exclusion and areas of FMZ 2 - Special Management not included in the informal reserve system because of size, configuration or location. These are equivalent to IUCN category IV.

Adaptive management may lead to local prescriptions, which also may exclude or modify forest operations to protect special natural heritage values. These may result from FMZ 3B - Special Prescription, locally modelled and mapped exclusions and exclusions following survey.

Within Monaro Region the main mechanisms to conserve values associated with forests will be:

- flora reserves under Section 25A of the *Forestry Act, 1916*
- Special Management Zoning under Section 21A of the *Forestry Act, 1916*
- Forest Management Zoning (FMZ) system developed by Forests NSW (*see below*), and
- implementation of the *Plantation and Reafforestation (Code) Regulation, 2001(P&R Code)*.

On other forested land in the region, application of environmental legislation such as *Native Vegetation Act, 2003*, *Environmental Planning and Assessment Act*,

<sup>1</sup> Forest Management Zoning (FMZ) is a land classification system which sets out in map format the way Forests NSW intends to manage areas across the State forest estate. The system was developed in consultation with other agencies and stakeholders during the CRA process. The characteristics of IUCN categories are detailed in Operational Circular 99/10 (*see Forest Management Zoning*).

*1979, Protection of the Environment Operations Act, 1997* and *Threatened Species Conservation Act, 1995* and development of voluntary conservation agreements will conserve values associated with forests.

## DEDICATED RESERVES

Within Monaro Region, the dedicated reserve network comprises 288 ha and includes one flora reserve, as detailed in *Table 1*. Further flora reserves in the area are managed under the ESFM plans for Eden and South Coast Regions. Dedicated Reserve areas are managed to maximise protection of high natural and cultural conservation values.

These areas have been set aside under Section 25A of the *Forestry Act, 1916* and can only be revoked by an Act of Parliament. They have been zoned FMZ 1 - Special Protection.

Management will generally exclude intentional disturbance but may facilitate education and scientific research, benign recreation and prescribe the use of fire to maintain and protect ecosystems in the landscape. Management activities will be guided by a working plan approved by the Minister administering the *Forestry Act, 1916*.

## INFORMAL RESERVES

Informal reserves in Monaro Region comprise 2,323 ha and include those areas of FMZ 2 - Special Management that are greater than 40 ha and wider than 200 m.

Management will generally exclude planned disturbance, except that associated with provision and use of infrastructure and protection of natural and cultural values. Management may also facilitate scientific research and prescribe the use of fire to maintain and protect ecosystems in the landscape. Mining under the provisions of the *Mining Act, 1992* may be permitted after meeting environmental assessment and development consent requirements.

Forests NSW, in consultation with NSW Department of Environment and Climate Change (DECC) and NSW Department of Primary Industries – Mineral Resources Division, have developed a model management plan for the informal reserves and a plan specific to Monaro Region within six months of the model plan being finalised.

### VALUES PROTECTED BY PRESCRIPTION

Within Monaro Region, there are no areas of values protected by prescription.

Details of areas in the landscape which are managed under values protected by prescription can be found in the ESFM plans for Eden and South Coast regions. Management of these areas generally excludes harvesting and associated disturbance but will permit grazing on leases held pursuant to the *Crown Lands Act, 1989*, mineral and petroleum exploration and the use of fire to maintain and protect ecosystems within the landscape.

### ADAPTIVE MANAGEMENT

Planted forest areas within State forests are equivalent to IUCN category IV and values may be protected by:

- protecting natural ecosystems in riparian habitat that has been excluded from establishment
- excluding disturbance from identified extreme erosion and water pollution hazard
- modifying the nature, intensity or timing of operations in an area, eg FMZ 3B or in catchments for limestone cave systems, and
- excluding disturbance from those elements of habitat or cultural heritage protected by application of prescriptions contained in the *P&R Code*.

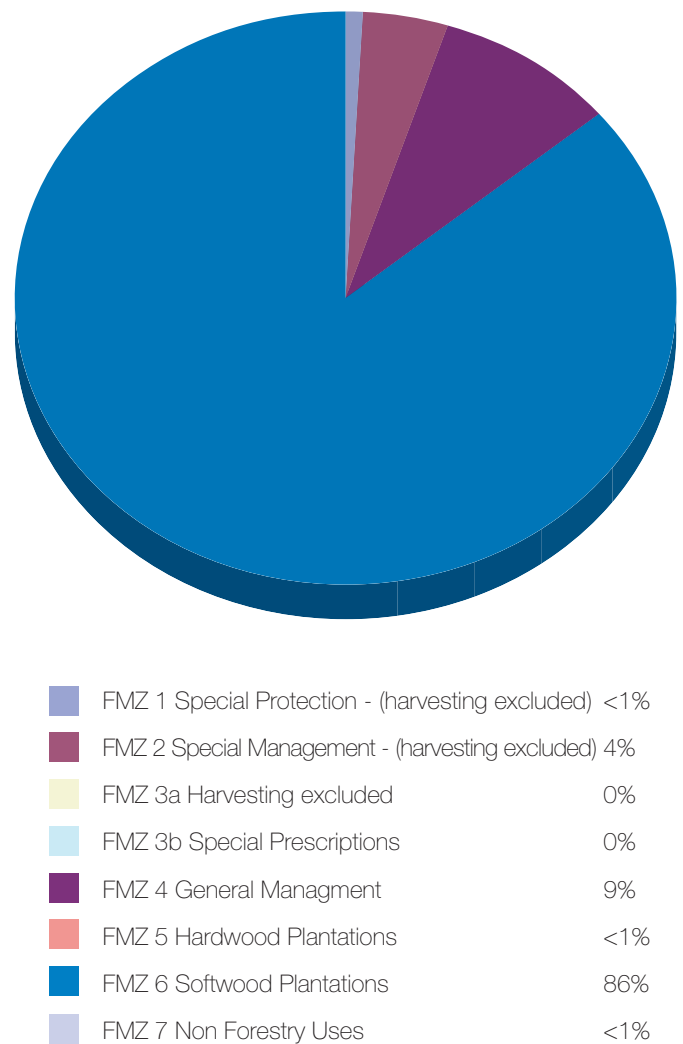
Prohibited and permitted activities are specified and incorporated into site specific operational plans (see *Part 9: Forestry Operations*)

### FOREST MANAGEMENT ZONING

All areas of State forest are allocated to a Forest Management Zone (FMZ). The characteristics of each zone, and the activities that are permitted or prohibited within them, are described in Operational Circular 99/10 - *Managing our forests sustainably: Forest Management Zoning in NSW State forests*.

The current distribution of FMZ across State forest together with land tenure is shown on the Forest Management Zones map and the proportion of State forest allocated to each zone is shown in *Table 2* and *Figure 2*.

Figure 2 – Forest Management Zones for Monaro Region



### PROTECTED AREA MANAGEMENT PLANS

Under the provisions of the *Forestry Act, 1916*, Forests NSW will develop a working plan for the flora reserve in Monaro Region as listed in *Table 3*.

The plan of management that Forests NSW prepares for informal reserves will describe the location, values and management strategies for these areas on State forest. The plan will take into account prescribed burning regimes, responses to wildfire, weed and pest animal management, road works and erosion control work.

All management plans will be publicly available documents.

# Nature Conservation

## MONITORING AND REPORTING

Forests NSW will use the ESFM criteria and indicators identified in the CRA to monitor and report annually:

- progressive change in State forest area, and
- extent and proportion contributing to conservation of natural and cultural heritage in the CAR reserve system (see Part 10: Consultation, Monitoring and Reporting).

Forests NSW will monitor and report annually on the completion of working and management plans, their implementation and relevance.

Forests NSW will monitor changes in management intent and, where appropriate, amend the FMZ. These changes will be monitored and reported annually.

Table 1: Monaro Region - forest cover by land tenure

Land tenure	Cleared (ha)	Plantation (ha)	Native forest (ha)	Percent of native forest	Total area (ha)	Percent of region
Private land <sup>1</sup>	803,824	18,790	568,410	32%	1,391,024	50%
Public land outside CAR system - (Crown Land excluding State forest <sup>1</sup> )	11,797		50,670	3%	62,467	2%
CAR dedicated reserve - (excluding State forest)	101,441		688,090	39%	789,531	29%
CAR dedicated reserve - (State forest <sup>2</sup> )	17		8,447	0%	8,464	0%
CAR informal reserve - (excluding State forest)	3,085		28,423	2%	31,508	1%
CAR informal reserve - (State forest <sup>2</sup> )	490		15,856	1%	16,346	1%
CAR Value by Prescription - (State forest <sup>1</sup> )	707		24,376	1%	25,083	1%
State forest - exclude by Adaptive Management <sup>1</sup>	1,916		83,139	5%	85,055	3%
State forest - plantation		39,548	14,595	1%	54,143	2%
State forest - general management <sup>2</sup>	2,130		300,345	17%	302,475	11%
State forest - (non forest use)		260	884	0%	1,143	0%
<b>TOTAL</b>	<b>925,407</b>	<b>58,598</b>	<b>1,783,234</b>	<b>100%</b>	<b>2,767,239</b>	<b>100%</b>

Notes: <sup>1</sup> Data from Southern and Eden ESFM plans

<sup>2</sup> Includes areas managed by Monaro and Southern Regions

Table 2: Monaro Region - Forest Management Zones as at 2005

Forests NSW Land Use	Area (ha)	Percent	Dedicated Reserve	Informal Reserve	Special Prescription
FMZ 1 Special protection - harvesting excluded	289	<1	289		
FMZ 2 Special management - harvesting excluded	2,323	4		2,323	
FMZ 3a Harvesting excluded	0	0			0
FMZ 3b Special prescriptions*	0.	0			0
FMZ 4 General management	5,194	10			
FMZ 5 Hardwood plantations	15	<1			
FMZ 6 Softwood plantations	46,383	85			
FMZ 7 Non forestry uses	259	<1			
<b>Total</b>	<b>54,461</b>	<b>100</b>	<b>289</b>	<b>2,323</b>	<b>0</b>

Notes: Data presented in Table 2 sourced from Forests NSW GIS Layers.

\* Data from Ecologically Sustainable Forest Management (ESFM) Plan – Tumut – Southern and Eden regions

Table 3: Flora reserves in Monaro Region as at 01/01/2004

Flora reserve	FR number	State forest	SF number	Area (ha)	Working plan status
Stingray Swamp	91	Penrose	703	265	Under review

# Part 5: Forest Health

## POLICY

Forests NSW will maintain or enhance the health and productivity of forests to support nature conservation, timber production and other ecologically sustainable uses within Monaro Region.

## BACKGROUND

The *National Forest Policy Statement (NFPS)* states, “protection of the conservation and commercial values of forests will necessitate protecting forest areas from the potentially harmful effects of diseases, weeds, pests (including feral animals), chemicals and wildfire.”

The State forest estate contains a mosaic of ecosystems that reflect the interaction of plants, climate, soil and human intervention to create planted forests. Natural ecosystems evolved under a fire regime of ignition by lightning and Aboriginal people, with little or no active suppression.

State forests are an integral part of the rural landscape. Activities that occur on them have the potential to impact on and be impacted by land management on adjacent lands.

Forests NSW recognises that healthy forests are the basis for productivity and also enable the provision of a greater range of possible community uses, products and benefits.

Forests NSW will maintain a vigorous and healthy planted forest estate in order to provide a reliable, high quality timber resource for industry.

## LANDSCAPE FOREST HEALTH

Both the *NFPS* and *Plantations for Australia: The 2020 vision* aim for a sustainable increase in the plantation resource, consistent with ecologically sustainable management.

In addition to the economic and community benefits, plantations deliver significant positive environmental outcomes, including effective management of soil and water and carbon sequestration.

Replanting trees allows some of the original natural balance of the catchment to be restored, while also achieving a reduction in dry land salinity in targeted areas.

Growing trees can enhance and restore soil by replacing organic matter and reducing compaction. Plantations can reverse damage to soil structure caused by over cultivation in intensive agriculture, as tree roots bind the soil reducing wind and water erosion.

As forests grow, they absorb carbon from the atmosphere and store or “sequester” the carbon in woody tissue. Planted forests have the potential to provide a “sink” for carbon as they grow, taking carbon out of the atmosphere and storing it in timber.

Studies have shown that planted forests can support greater species diversity than the cleared and semi-cleared agricultural land they replace, while any remnant native vegetation in these areas will support improving species diversity. Within the plantation estate are patches of native vegetation. These areas will be maintained and managed in accordance with the *Plantations and Reafforestation Regulation (P&R Code), 2001* and will complement the Comprehensive, Adequate and Representative (CAR) reserve system network.

Planted forests have been and will continue to be used to a varying degree to repair degraded landscapes, such as those impacted by agriculture, mining or for the stabilisation of steep slopes.

Forests NSW will maintain landscape forest health within Monaro Region by:

- increasing the planted forest estate by reafforesting previously cleared land under the provisions of the *P&R Code*, and
- maintaining native vegetation patches within the planted forest estate as per the *P&R Code*.

## FIRE MANAGEMENT

Fire is one of the great recurring threats to the planted forest estate. Due to the level of investment required in plantation development and the susceptibility to fire of some plantation species, Forests NSW takes a very active role in fire management, including detection and suppression activities and hazard reduction.

Forests NSW has legal obligations under the *Rural Fires*



## Forest Health

Act, 1997 and is committed to protecting human life, property, biodiversity and cultural values from high intensity fire regimes.

Forests NSW has a fire management policy that commits the resources of the organisation for emergency fire management. In conjunction with this, all wildfires on State forests which cause, or are likely to cause, damage will be controlled and forest fuels will be managed, in part, by the use of prescribed burning.

Forests NSW participates in coordinated fire management in Monaro Region through Bombala, Wingecarribee, Snowy River, Bega and Lake George zone Bush Fire Management Committees. These committees cooperatively develop a Bush Fire Risk Management Plan across all land tenures and Operational Plans for the prevention, detection and suppression of bushfires. Bush Fire Risk Management Plans identify many, but not necessarily all, of the community and environmental assets across all land tenures, and the threat posed by wildfires.

Consolidation of the planted forest area, rather than a fragmented estate, allows for increased effectiveness in fire management due to efficiencies in detection and ability to respond to wildfire. Risk of damage by wildfire is also minimised with less boundary for fire to enter the plantation estate.

Fuel management in Monaro Region will be consistent with the principles of the *Integrated Forestry Operations Approval (IFOA) for Eden and Southern regions*. The IFOA recognises Forests NSW responsibilities and contribution to coordinated fire management, and seeks some additional environmental safeguards in the fuel management process.

Forests NSW uses results from many years of its own research, and that of other organisations, into fire behaviour and fire effects when planning and implementing fuel management and fire suppression.

Forests NSW research has shown that intentional frequent low intensity fire regimes result in a spatial and temporal mosaic of burnt and unburnt areas and that many fire sensitive plants are protected by their position in the landscape.

Forests NSW will use low intensity prescribed burning in native forest areas to manage fuel characteristics and moderate wild fire behaviour and protect the forest health of both planted and native areas, economic assets and people. Fuel characteristics can also be managed by use of permanent firebreaks where ground conditions allow access by machinery. However, fire breaks are ineffective unless augmented by broad area fuel management activities.

Fuel Management Plans and Fire Suppression Plans, which are consistent with the Bush Fire Risk Management Plan, are prepared to protect the State forests of the region. The Regional Fuel Management Plan will also assess the potential environmental impact of wildfire without fuel management burning compared with the impact of wildfire and fuel management burning. This will be assessed within the context of fire history including fire intensity and frequency.

An Annual Plan of Burning Operations is issued through the Rural Fire Service's (RFS) Bushfire Risk Information Management System (BRIMS) to each Bush Fire Management Committee.

Details of each proposed burn indicate the area and season in which it is intended to burn and are entered into BRIMS. BRIMS is updated monthly as areas are burnt under suitable weather conditions. Members of the relevant bush fire management committee have access to this RFS information.

Forests NSW may declare a plantation fire threat period when work restrictions, beyond those imposed by the statutory bush fire danger period, are required.

Site-specific operational plans are prepared for each fuel reduction burning operation (see *Part 9: Forestry Operations*). Forests NSW also specify measures to be taken to:

- minimise adverse impacts on the environment
- minimise the risk of escape causing wildfire, and
- monitor the impacts on the environment.

Wildfire suppression is facilitated by a large bush fire fighting resource including trained personnel, well maintained equipment and plant, fire towers and aircraft. Suppression activities will be in accord with the operational fire plan for the region.

## Forest Health

Forests NSW annually reports on fire prevention and suppression performance. This allows Forests NSW to assess historic patterns of fire outbreaks and damage and to guide future fire management actions and policies.

### DISEASE MANAGEMENT

Disease has the potential to compromise productivity, or cause death, in plantations. Some major pathogens include:

- *Dothistroma septospora* – a needlecast fungus that attacks young *Pinus* needles under moist warm conditions in closed canopy stands up to 15 years old. It rarely causes death, but will severely slow tree growth
- *Cyclaneusma minus* – another needlecast fungus that is widespread and prevalent in *Pinus* stands 15-20 years old. Similar to *Dothistroma*, it can cause growth losses in moist and humid conditions
- *Sphaeropsis sapinea* (previously *Diplodia pinea*) – damage is rare but can lead to stem cankers, shoot dieback, dead topping or stem death, particularly in stands suffering drought stress or hail damage, and
- *Phytophthora cinnamomi* and *Armillaria luteobubalina* – both root diseases that infect trees on some sites. Widespread death is not common.

Ideally, stands should be thinned to encourage good air flow and regularly monitored to detect incidence and treatment should be determined in accord with environmental and commercial principles. More detailed management of diseases is outlined in the Forests NSW *Planted Forests Silviculture Manual*.

### PEST INSECT MANAGEMENT

Forest insects, at some stage in their lifecycle, generally utilise some part of a tree – leaves, bark, wood, limbs or roots, whether it be for sustenance, protection or egg laying. Outbreaks of insects occur in vigorous healthy stands as well as in those that are stressed or declining. The impact of insects is always greater on trees growing sub-optimally. As well as impairing tree health and vigour, insects may degrade timber.

Some major insect pests include:

- *Sirex noctilio* - a wood wasp that lays its eggs on *Pinus* species. The larvae tunnel into the wood and the associated fungi cause deterioration in wood properties. Tree death is common
- the exotic Monterey pine aphid *Essigella californica* - a sap sucking insect that causes defoliation and retards growth. Trees often recover in the following year, and
- bark beetles such as the exotic *Ips grandicollis*, which breed in logging slash and can infect young plants in suitable conditions and damage felled logs.

Management of insect pests is in accord with the *Planted Forests Silviculture Manual*. In particular, *Sirex* is managed through an annual biological control program involving trap trees and injection with nematodes.

Annual forest health surveys are undertaken to identify disease and insect problems as a priority but also to note any problems with nutrition, weed competition and frost damage.

### FOREST NUTRITION MANAGEMENT

Nutrition is important to maintain health and vigorous growth in trees to efficiently produce straight stems that can be used for timber production.

Australian soils are typically low in phosphorous and, while much of the native vegetation has developed techniques to deal with this, exotic species still require higher concentrations for optimal growth on some sites.

On improved pasture sites there is often a boron deficiency compared to other nutrients which, if left unchecked, will result in deformed stems.

Low nutrient supply to the plant is normally exhibited through the foliage. Forests NSW undertakes a foliage sampling and analysis program (crop logging) for exotic conifers to determine the nature and quantity of fertiliser required and at what age it should be applied. Nutrition in planted forests is addressed in the *Planted Forests Silviculture Manual*.

## WEED MANAGEMENT

Where unwanted plants or weeds are of major concern to economic production, the environment or public health, they can be declared noxious under the *Noxious Weeds Act, 1993* or listed as a key threatening process under the *Threatened Species Conservation Act, 1995*.

In planted forests, weeds compete with planted seedlings, often causing localised drought in the rooting zones, resulting in a loss of growth or death of the seedling. After plants become established, woody weeds may compete strongly by robbing the seedlings of nutrients, soil moisture and sunlight, thus inhibiting growth and reducing forest productivity.

Within the Monaro Region, around 73 plants have been declared noxious by local government. Forests NSW has joined with local government, other agencies and stakeholders to develop regional strategies to manage these weeds and other plants of concern. No actions have been negotiated with Forests NSW for inclusion in threat abatement plans.

Within the State forest areas the major plants of concern are:

- Blackberry (*Rubus fruticosus*) – mainly occurring in higher elevation tableland forests
- Serrated Tussock (*Nassella trichotoma*) – occurring in some grassy forests near farmland, and
- St John's Wort (*Hypericum perforatum*).

Forests NSW will develop an annual program of weed control works as identified in the Monaro Regional Weed Management Plan.

Weed competition within planted forests is managed as outlined in the Forests NSW *Planted Forests Silviculture Manual* and detailed in the operational plan.

Pine wildings in native vegetation adjacent to mature pine plantations are recognised as having the potential to impact on regeneration of native species as well as having a visual impact. This issue is most prominent in drier native forest types. Control methods include the use of prescribed fire, physical culling including commercial harvesting and

chemical herbicide application. Forests NSW participates in cooperative research programs into both the impact and effective control of pine wildings. It will also monitor the impact of pine wilding invasion of sensitive native ecosystems when prioritising annual weed control programs.

Forests NSW is committed to a reduction in reliance on chemical use. It contributes towards, and participates in, research into alternative weed and pest control practices such as biological control methods. Current methods and practices are regularly updated and listed in the Forests NSW *Chemicals Manual*. Operational plans will consider alternatives to chemical control methods. Where control involves the use of herbicides the *Chemical Manual* and operational plan will address the type of herbicide, application techniques, environment protection measures and the safe storage, handling and disposal of containers. Herbicides are selected for knockdown and/ or residual control ability. Monitoring reveals if follow-up work is necessary. Where aerial application of herbicides is necessary it is carried out under strict controls required by the *Pesticides Act, 1999* and the NSW Agriculture NSW *Weed Strategy*.

Forests NSW will monitor the results of weed management activities and detail outcomes each year in health survey reports and the *Social, Environmental and Economic (Seeing) Report*.

## PEST ANIMAL MANAGEMENT

Animal pests are of concern when they impact on environmental or economic values of the forest or neighbours. Predation, habitat modification or competition by pest animals can be identified as a key threatening process under the *Threatened Species Conservation Act, 1995* or pest animals can be declared noxious under the *Rural Lands Protection Act, 1998*.

Animals which are of concern to the health of planted forests in Monaro Region include:

- rabbits, hares, kangaroos, wallabies and possums who eat growing shoots, strip bark and ringbark seedlings
- deer, goats and pigs which cause damage by digging, browsing and rubbing



## Forest Health

- dogs, foxes and cats which kill and eat native animals and domestic livestock and compete with native carnivores, and
- domestic livestock – particularly in the first three years after planting, as they browse and cause physical damage to seedlings by trampling and rubbing.

Forests NSW liaises with the Rural Lands Protection Board (RLPB), local government, other agencies and stakeholders to develop regional strategies to manage these pest animals.

Under the IFOA for Southern and Eden regions, Forests NSW is required to develop a *Pest Animal Management Plan* which will also meet the requirements of the licence under the *Threatened Species Conservation Act, 1995*. Monaro Region will coordinate with Native Forests Operations Branch via their *Pest Animal Management Plan* to achieve these outcomes.

The Plan will identify species of concern, their distribution, priorities for control programs and methods to be used. Generally control programs will target:

- species that threaten the establishment and commercial viability of the planted forests
- foxes in target areas with treatments identified in the Fox Threat Abatement Plan developed under the *Threatened Species Conservation Act, 1995*
- wild dogs and pigs where they are a threat to domestic stock and the environment, and
- other species, such as cats, where appropriate control methods become available.

All control work will be carried out to a standard that accords with the *NSW Agriculture Vertebrate Pest Control Manual* and implements the requirements of the *Pesticides Act, 1999*.

Forests NSW will develop an annual program of work based on information from previous programs, landholders, RLPB and other agencies and apply the procedures in the *Pest Animal Management Plan*.

Forests NSW will monitor activity around bait stations, baits taken and reports of predation on livestock.

## ADVERSE CLIMATIC EVENTS

A number of short and long-term weather events impact on plantation health and growth directly via physical damage or indirectly by presenting opportunities for disease and pest attack.

- frost – tree dieback and death in young plantations, particularly on high altitude sites
- wind – trees can be bent over, snapped off or blown down over large areas
- hail – tree bark damage weakens the defence mechanisms and in some cases allows the establishment of fungal diseases such as *Sphaeropsis sapinea*
- snow – tree branches and stems are bent or broken by snow accumulation in the crowns, and
- drought – tree death or slow tree growth is caused by prolonged water deficits. Stress from drought can also weaken plants, allowing secondary infections.

Prevention and remedial actions to ameliorate the effects of adverse climate are identified in *Forests NSW Planted Forests Silviculture Manual*.

## COOPERATIVE ARRANGEMENTS

Forest health control measures are generally only successful if they are carried out across all land tenures. They are, therefore, dependent on consultation and a cooperative approach. Because of the close relationship between planted forests of Monaro and native forests of the Southern and Eden IFOA regions joint arrangements have been put in place to ensure the close collaboration for forest health control across all Regions.

Control measures will require ongoing liaison and coordination with NSW Department of Environment and Climate Change (DECC), RLPB's, the RFS, local government, lessees and neighbouring landholders.

## CHEMICALS HANDLING AND WASTE MANAGEMENT

Chemicals may be used on State forests to maintain forest health through weed and pest animal management and fire

fighting. Waste materials and vehicles are from time to time dumped without authority in State forests.

Forests NSW will operate within the requirements of the *Occupational Health and Safety Act, 2000* and the *Pesticides Act, 1999* when storing, transporting, handling and using or dealing with spills of dangerous goods and or agricultural chemicals. Relevant staff will be adequately trained and equipped while storage and handling facilities will meet legislative requirements. Forests NSW has developed a *Chemicals Manual*.

Where it appears that chemicals spilt on State forests may have an impact on environmental values, Forests NSW will contact the Wollongong Regional office of DECC Ph (02) 4224 4100 or for pollution incidents Ph 131 555.

As part of a State response to litter and unauthorised dumping, Forests NSW represents NSW Department of Primary Industries (DPI) on the NSW Litter and Illegal Dumping Action Alliance which will develop State-wide strategies. In the interim, Forests NSW reports unauthorised dumping of contamination wastes to DECC and investigates other waste with a view to prosecution and removal at the first opportunity to appropriate landfill or specialised handling sites.

## FOREST RESEARCH AND DEVELOPMENT

Forests NSW recognises that better information provides an impetus for adaptive management and the continuous improvement process that is critical to Ecologically Sustainable Forest Management (ESFM).

Forests NSW takes an active interest in State and Commonwealth quarantine issues and maintains an ongoing close collaboration with the Australian Quarantine Inspection Service (AQIS) to minimise the rate of introduction of exotic pathogens, decay fungi and invertebrate pests and to increase the likelihood of successfully eradicating those incursions that do occur.

Forests NSW has participated in Cooperative Research Centre (CRC) projects aimed at improving forest management practices, for example in forest hydrology, and is at present an active member of the CRCs for Green House Accounting, Bush Fires and Sustainable Landscapes.

## SUPPLEMENTARY PLANS

Forests NSW will finalise and make publicly available, regional plans for:

- Pest Animal Management
- Weed Management, and
- Fuel Management and Fire Suppression.

These plans will only be publically available when finalised.

## MONITORING AND REPORTING

Forests NSW undertakes forest health surveys each year to assess the effects of pests, diseases, weeds and weather on planted forest areas. Results are summarised in the *Plantation Health Survey Report* that details the current condition of forest stands. The report identifies any areas where forest health is of concern and recommends management options. A summary of the findings will be included in the ESFM annual report.

The area, cost and effectiveness of forest health treatments will be monitored on an annual basis.

Improved monitoring techniques and indicators are to be developed over the next five years and incorporated into subsequent plans. Forests NSW, in conjunction with CSIRO, is currently investigating the use of high-resolution remote sensing techniques to monitor forest health, vigour and response to treatment.

Progress with forest health issues is also reported in the annual *Seeing Report*.

# Part 6: Sustainable Timber Supply

## POLICY

Forests NSW will optimise the supply of timber products from planted forests within ecological constraints and within a long-term framework.

## BACKGROUND

The *National Forest Policy Statement* (NFPS) identifies ecologically sustainable timber production and the development of an internationally competitive timber products industry as one of the broad national goals for forests. In this context, the establishment of plantations should be determined on the basis of economic viability and international competitiveness.

The NFPS envisages that the planted forest industry will expand, be economically viable and provide a reliable high quality timber resource to industry. The planted forests would provide the basis for efficient industries that maximised value adding.

The NFPS recognises the commercial, aesthetic and environmental benefits of planted forests. Expansion should be limited to substantially cleared land. Productivity improvement should be pursued through improved technology, plant breeding and species selection.

In NSW, the legislative framework for timber supply in government owned plantations is set by the *Forestry Act, 1916* which sets out long-term objectives of conservation and utilisation of timber from land under its control. The *Plantations and Reafforestation Act, 1999* allows for an integrated framework for plantation development, and an associated harvest guarantee.

The capacity of the planted forests to supply timber depends on the extent and nature of the resource, growth rates, appropriate silviculture and market availability. Substantial investment in the timber products industry will occur where the quantity and quality of the raw materials can be assured.

Within Monaro Region, the rate of plantation establishment over time has varied yearly, based on the availability of lands, damaging wildfire history, funds and NSW and Commonwealth policy and legislation. This, together

with the progressive expansion of the timber processing industry, has resulted in a mosaic of plantation forest areas and ages. This is summarised in *Figure 3*.

Silvicultural thinning operations<sup>1</sup> are designed to maintain forest health and optimise the growth of trees capable of producing sawlogs during later harvesting operations. Forests are resilient: if thinning is delayed forests will keep growing. However, tree selection then becomes a natural process, growth of desired stems may be sub-optimal and take longer than desired to meet market standards and the forest may be more susceptible to damage by agents such as fungi, insects and adverse climatic events.

Scheduling timber flows from planted forests over a long-term timeframe needs to be flexible, catering for variations in industry requirements and the forest estate. The complexity of the forest estate is captured and recorded in forest management information systems. Forests NSW uses a Geographical Information System (GIS) and a stand record system to capture the history and current status of the resource and support the development of operational planning and scheduling within the forest.

Yield prediction and monitoring systems contribute to Forests NSW estate modelling, optimising the value of the resource within supply commitment constraints over a long-term timeframe.

Estate modelling gives Forests NSW the capacity to match existing supply commitments against resource capacity, optimise the utilisation of the resource to meet commercial objectives and identify opportunities for further sales and timber industry growth. The predictive capacity of estate modelling is balanced by 'real world' checks, including ongoing review of silvicultural strategies against measured forest performance and comparison of predicted *versus* actual harvest yields.

## TIMBER AVAILABILITY

There are a number of factors to take into account in determining timber supply from State forests in Monaro Region. These include:

<sup>1</sup> Thinning is the harvesting of selected, generally suppressed trees. Thinning improves the growing space, quality and volume of retained trees.



## Sustainable Timber Supply

- net (plantable) area of 35,900 ha
- current and future market framework
- use of appropriate silviculture, and
- accounting for differences in age, growth potential (site quality) and silvicultural history (stand structure and condition).

Estate modelling for the next 10 years predicts the annual production of Monaro Region's plantations to be around 600,000 m<sup>3</sup> of commercial timber.

### PRODUCTIVE CAPACITY

Based on site conditions, optimal silviculture and the existing age class distribution the forests within Monaro Region have a potential to grow at between 11 m<sup>3</sup>/ha and 18 m<sup>3</sup>/ha each year with an annual average of 16 m<sup>3</sup>/ha. This potential is reduced due to the market and ecological framework within which Forests NSW operates.

### MARKET FRAMEWORK

Modern sawmilling and timber processing plants handling plantation timber rely on large through-put to achieve an economy of scale. Sawmills prefer logs to be reasonably uniform with a limited diameter range, and be as straight as possible. The timber should be physiologically mature to optimise strength ratings.

Improvements in log segregation, based on size and quality, will allow for better optimisation of available markets for timber.

Though some log products are supplied to markets beyond the boundary of the Region, the majority of logs are supplied to industries adjacent to the plantation estate. The establishment of timber industries within the Region maximises the value estate. Where necessary to achieve market objectives, Forests NSW may supplement supply from other Forest NSW supply zones.

### ECOLOGICAL FRAMEWORK

Ecological sustainability is assured by incorporating the modelling process and applying the *Plantations and Reafforestation Regulation (P&R Code), 2001* conditions during operations.

The ecological framework is comprised of:

- a comprehensive, adequate and representative (CAR) reserve network within the wider geographical area and dedicated reserves, informal reserves and values protected by prescription within the plantation (see *Part 4: Nature Conservation*)
- replanting clearfelled areas as per the *P&R Code*, and
- periodic review of timber availability and supply commitments based on monitoring of areas and volumes harvested and improvement of the timber yield models.

### TIMBER COMMITMENTS

Based on modelling of the plantation the Government of NSW has made long-term commitments to supply industry, allowing over \$100 million to be invested in timber processing in Monaro Region.

Timber supply agreements require Forests NSW to supply, and the other party to take, timber in certain volumes and quality per annum. These agreements may be reviewed under special circumstances.

For the next 10 years, supply agreements from Monaro forests have been made for approximately 575,000 m<sup>3</sup> of roundwood on average per annum.

### TIMBER SUPPLY STRATEGY

To ensure timber commitments are met, Forests NSW may:

- match supply commitments and sales arrangements with predicted resource availability
- maximise mill door sales to ensure effective log utilisation and segregation
- identify and seek new markets for volumes of timber outside current supply commitments and specifications
- take advantage of advances in tree breeding
- improve establishment and tending techniques to maximise early growth
- ensure appropriate species selection, taking into account site suitability and current and future market requirements

# Sustainable Timber Supply

- apply fertiliser after thinning to improve the growth response to thinning
- plant additional areas to expand the resource base in the longer term, and
- replant clear-felled areas, according to the *P&R Code*.

## SCHEDULING AND OPERATIONAL PLANNING

Forests NSW prepares a three year Plan of Operations for timber harvesting that is reviewed annually. This lists the areas which will supply Monaro Region's timber commitments.

Forests NSW use estate modelling tools to help determine areas available for the Plan of Operations. This takes into account supply commitment reflected in market and product demand, the estimated ability of the forest to supply, the ability of the forest to support harvesting operations during periods of wet weather and logistical issues.

Operational harvesting plans are produced according to the guidelines in the *Planted Forests Harvest Plan Manual*. They focus on effective field implementation and include a map at an appropriate scale (see *Part 9: Forestry Operations*).

The Plan of Operations and harvesting plans are available for public inspection and copying.

## SILVICULTURE

Silviculture is the art and science of maintaining a forest in a healthy condition during its development. Within planted forests, the silvicultural objectives are to:

- provide a sustainable supply of forest products and values
- maximise financial return from timber productivity
- identify and seek new markets for volumes of timber outside current supply commitments and specifications
- protect forest health, and
- maintain flexibility to cope with market opportunities.

Forests NSW *Planted Forest Silviculture Manual* ensures consistency in planning and field application of silvicultural practices. It incorporates an outline of the ecological

principles driving forest dynamics and describes how to apply forest operations such as establishment, tending and harvesting to achieve management objectives.

Establishment and harvesting operations are also subject to the conditions of the *P&R Code* and are designed to maintain ecological processes while maintaining forest health and promoting growth.

Planted forest sites are assessed by matching the intrinsic biology of species to site characteristics such as soil, climate, animal pests, weeds and diseases. Economic evaluation takes into account growth rates, product yields, proximity to markets, wood characteristics and cash flows.

Consideration is given to heritable characteristics when selecting genotypes of tree species for breeding and deployment, specifically those which exhibit desirable growth rates, growth habit, pest and disease resistance and wood properties, with the aim of maximising forest quality and health. Forests NSW does not use, nor intend to use, genetically modified organisms (produced using gene technology) in State forests.

Effective site preparation ensures optimum conditions for seedlings to become established and to allow access for subsequent operations. Site preparation may include clearing of remnant vegetation and stacking and burning of woody debris (or treating *in situ* if not too heavy). Ground cultivation improves soil tilth and root penetration and assists in weed control.

Seedlings are raised at specialised nurseries with strict hygiene regimes to protect seedling health and produce seedlings that meet stringent specifications. Seedlings need to be able to withstand transplant shocks associated with lifting, sorting, packaging, transport over long distances and planting in open exposed sites.

Weeds compete with planted seedlings for moisture, light and nutrients. Control of weeds is important to maintain optimum growth conditions. The *Planted Forests Silviculture Manual* outlines acceptable methods for different species and, where herbicide use is envisaged, appropriate rates and methods of application (see *Part 5: Forest Health*).



## Sustainable Timber Supply

Stand density, or the number of trees per hectare, affects forest production, log characteristics and value, propensity for wind and snow damage and disease susceptibility. Stand density is managed through appropriate spacing at the time of planting. As planted trees show signs of competition, less thrifty trees are removed (thinned) to allow moisture, nutrients and light to be used by the better quality trees. Silvicultural thinning will be implemented commercially through planned and supervised operations wherever possible.

Fertilisers can be used to improve nutrition and tree growth. The type, rate and timing of application of fertiliser is generally determined by assessing foliage samples and applying the growth response results of past research to identify commercial benefits.

In some species, tree limbs are often retained for the life of the tree. Retained branches cause knots in logs from those trees. Also, these branches may provide a continuum of fuel from the forest floor to the top of the tree. Pruning removes the limbs, allowing a break in the fuel continuum and knot free timber to be formed from that time onwards. Where pruning is carried out, care is exercised not to remove too much green crown and impinge on tree growth.

### MODELLING IMPROVEMENTS

The estate modelling used by Forests NSW relies on applying yield estimates to varied species and stands to predict available volume at any given point in time. Yield estimates (or yield tables) are built from inventory measurements or historical yields combined with a predicted silvicultural tending regime.

Forests NSW has a commitment to continually improve its estate modelling and will progressively implement the following programs:

- improve stratification of planted forest areas to aid future sampling and modelling
- refine harvestable area predictions
- update inventory plots
- revise the permanent growth plot data system

- revise yield tables and growth models with additional field data
- improve growth and mortality models, and
- monitor and incorporate progressive yield data between five yearly review periods.

Estate modelling improvement will continue as an ongoing program.

The predictive capacity of estate modelling is balanced by 'real world' checks, including on-going review of silvicultural strategies against measured forest performance and comparison of predicted versus actual harvest yields.

### MONITORING AND REPORTING

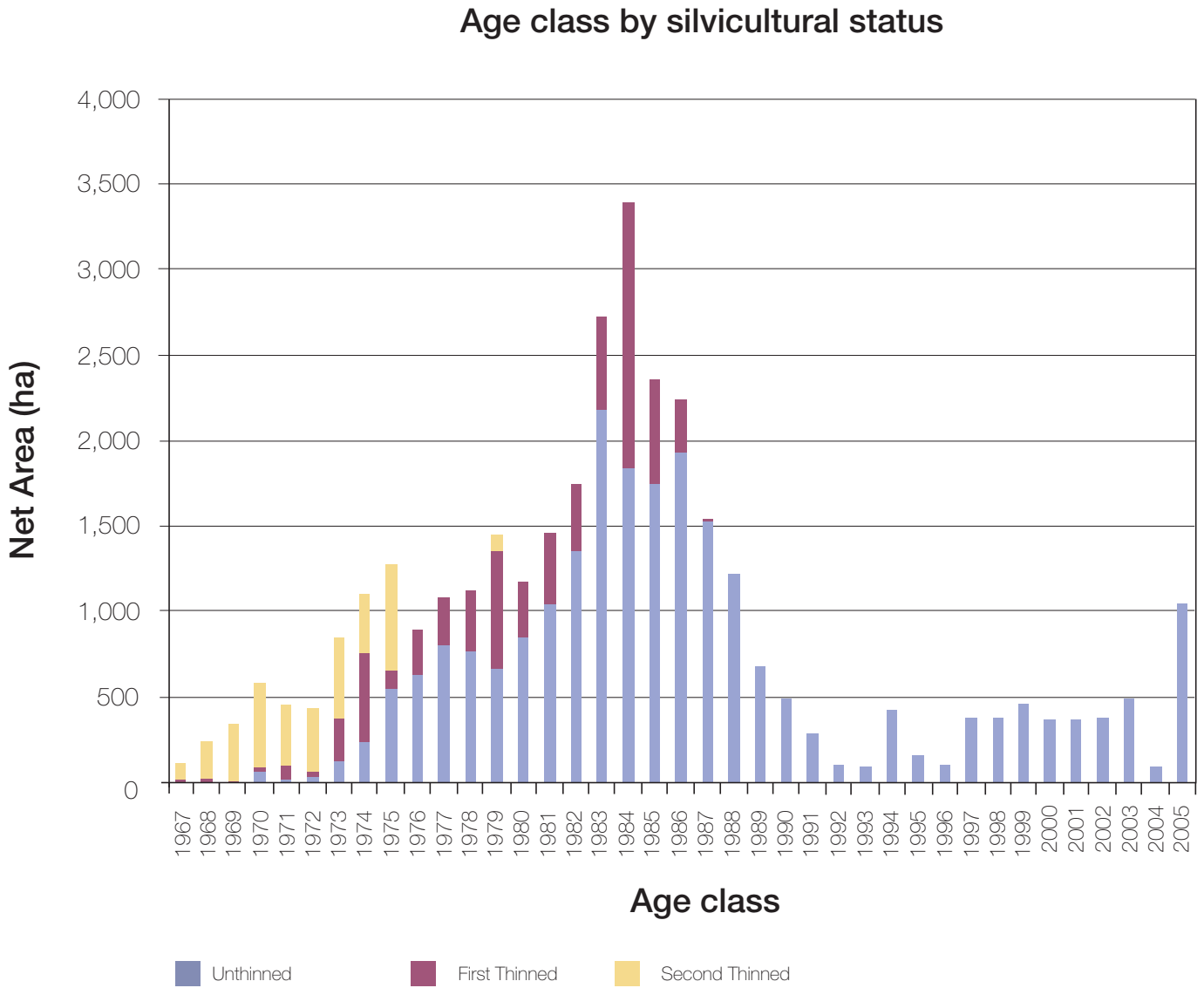
The volume of timber products harvested, area harvested and conditions under which products were obtained will be monitored against predicted yields and reported annually.

The achievement of prescribed silvicultural and environmental outcomes will be assessed after harvesting. Assessments may be based on sampling of representative areas.

This and other data will provide input to predictive model components and assist in further refining and developing future timber yield estimates.

# Sustainable Timber Supply

Figure 3: Age and silvicultural condition of commercial Pinus radiata stands in Monaro Region as at May 2006



Note : The total net stocked area of plantation varies daily based on the balance between forest harvesting and plantation establishment activities. The figures quoted above were correct as at May 2006.

## POLICY

Forests NSW will, within an ecological framework, maximise economic returns from planted forests and its contribution to the economic well being of the communities within Monaro Region.

## BACKGROUND

The *National Forest Policy Statement* (NFPS) identifies sustainable economic use of native forests and plantations as one of its principal objectives capable of providing national and regional economic benefits.

The NFPS indicates that plantations provide the opportunity to increase the availability of timber production over and above that, which can be provided through sustainable management of native forests.

Within Monaro Region, the town of Bombala is heavily reliant on the expanding timber industry for its economic viability although agriculture, mainly sheep and cattle farming, has historically been the main source of wealth and remains, in addition to timber, the primary base of the rural economy.

The growth of the Bombala community has been linked to the growth of the planted forest estate and employment in forest management and timber harvesting and haulage, sawmilling and processing.

The Region's plantations also make a small contribution to the local economy of Moss Vale and the Canberra Region. Generally, unemployment levels are relatively low and local authorities encourage economic diversity.

The flow-on effect of this economic viability ensures the provision of additional services within these communities, such as education, health, and correctional facilities. The social benefits to the regional community of employment, water, social infrastructure and recreation are identified in *Part 8: Social Development*.

## COMMERCIAL USE OF STATE FORESTS

The 39,550 ha of planted forests resource in Monaro Region was valued at \$188.5 million in 2004-05. It is a valuable asset for fostering economic growth. It provided revenue of \$18.5 million to NSW in that period and, in

the same period, Forests NSW invested \$2.065 million in capital asset development and \$15.3 million directly into the regional economy including \$0.422 million to local government to subsidise the improvement and maintenance of rural roads.

Timber and timber products processing are by far the largest commercial enterprises reliant on planted forests managed by Forests NSW. Other commercial enterprises that rely on the forest resource include non-timber products, forest materials, grazing, apiary, tourism, special events and social infrastructure.

Major timber products available from planted forests in this Region include sawlogs, preservation timber and pulpwood. Other miscellaneous timber products include fencing, landscape timber and firewood.

Timber sales account for 91% of the Region's commercial activities, with sawlog sales at around 60% and pulpwood sales at 31%. Forests NSW sells the major timber products to customers at the mill door (*see Mill Door Sales*).

Non-timber products from State forests include foliage, flowers and seed while forest materials include sand, hard rock and ridge gravel. An increasingly important non-tangible product available from forests is the carbon that is stored in timber, and the potential to sell this in a carbon trading market.

Rental of land for grazing, for both sheep and cattle, as well as for special purposes such as tourism and special events provides additional revenue.

The natural resources that Forests NSW supplies to commercial enterprises are summarised in *Table 4*.

## PLANTATION TIMBER INDUSTRY

Since World War II, New South Wales followed a strategy of plantation development to satisfy the expanding regional and state demand for timber and to reduce Australia's reliance on imported timber products.

As the planted forest estate grew to its present size and earlier plantings matured, its capacity to support industry increased (*see Part 6: Sustainable Timber Supply*).



Each year the plantations of Monaro Region provide up to 0.4 million cubic metres / tonnes timber comprised of sawlogs, round preservation timber and pulpwood. The timber is generated from both thinning and clear felling operations.

Based on the extensive well managed planted forests and security of resource supply offered by Timber Supply Agreements, industry has invested in a treated timber plant and small sawmill at Bombala. However there is the potential for a much larger sawmill which is currently under consideration. Investment in these facilities has injected several millions of dollars into the local economy.

A smaller scale plant with a commensurate but still substantial level of investment has been established at Penrose near Moss Vale. This plant both saws and treats timber which allows more complete utilisation of the small resource available in that area.

The Tallaganda resource is limited in area and volume and has been used historically to provide additional resource to sawmills at Moss Vale, Canberra and Bombala.

Timber from the planted forests of Monaro Region may also be supplied to other centres to assist them meet their supply targets and about 75,000 tonnes of pulpwood and low quality sawlog from the Bombala group is currently exported via the port of Eden to several overseas destinations. In addition, a small volume of pulpwood is processed domestically at Tumut.

While the planted forests managed by Forests NSW supply the bulk of the timber resource at the present time there are substantial private plantings, largely in the Bombala area, that will supply significant volumes in the future.

Industry of this magnitude places demands on regional infrastructure and requires significant coordination to ensure acceptable amelioration of impacts. To this end Forests NSW participates in a number of regional committees and liaises closely with local government councils (see *Part 10: Consultation, Monitoring and Reporting*).

Softwood timbers are not processed efficiently in mills designed to process native hardwoods. There is little opportunity for interchange of resource between softwood and hardwood elements of the timber using industry.

Timber processing plants and complexes are located on the attached regional map.

## CARBON

The Kyoto Protocol indicates that any plantations established on or since 1 January 1990 which afforest previously cleared land qualify as carbon sinks, where the amount of carbon sequestered is greater than that released.

The NSW Government has established the NSW Greenhouse Gas Abatement Scheme, which imposes benchmarks for the emission of greenhouse gases on all electricity retailers and some other high use participants. Participants can reduce their emissions to the benchmark level (108% of 1990 emissions) by off-setting their excess emissions through the surrender of NSW Greenhouse Abatement Certificates (NGAC's). Carbon sequestration in forests is one way of generating NGAC's.

Forests NSW has been accredited as an NGAC provider. Although planted forests have been established generally for timber production, the sale of NGAC's adds to their product range.

Forests NSW is participating in the CRC for Greenhouse Accounting to improve its understanding of carbon sequestration and to maximise the potential for sale of NGAC's.

## MILL DOOR SALES

Traditionally, sales of timber were of standing trees forest workers involved in the harvesting and haulage of timber were engaged by sawmill and processing plant owners. Recently, Forests NSW began selling timber at the mill door and engaging harvesting and haulage contractors in an effort to:

- optimise the value of timber products produced from the forest estate
- improve product segregation and deliver products that comply with standard specifications
- promote investment in new processing facilities by being able to supply commercial quantities of logs of unique specifications that differ from standard sawlogs

- maintain safety standards in an otherwise dangerous industry through uniform workplace management by a single employer
- facilitate inter-regional product flows to maintain industry in response to adverse climatic events, and
- enable Forests NSW to respond in a timely manner to commercial opportunities for “spot sales” when they arise.

### FUTURE DEVELOPMENTS

To remain effective as a commercial entity and be successful as a public trading enterprise, Forests NSW must explore other fields and diversify its product range.

To encourage private investment in planted forest establishment, Forests NSW is using its expertise to establish and manage areas for third parties. Planting can be on Forests NSW land or private lands and agreements apportion benefits based on commercial principles. Plantings are essentially to produce timber but other benefits can include carbon sequestration, generation of NGACs and remediation of degraded land.

Use of end-of-rotation felling wastes offers the energy industry an opportunity to generate electricity from a renewable resource as an alternative to using fossil fuels. Electrical power generated from biofuels derived from planted forest sources qualify as renewable energy under the NSW Greenhouse Gas Abatement Scheme.

Forest sites may offer an opportunity to locate wind turbines for renewable energy generation. Subject to NSW Government policy, Forests NSW could explore the feasibility of wind power generation on planted forest sites.

### THE NATIVE TIMBER INDUSTRY

The ESFM plans for South Coast Sub-region and Eden Region describe the components of the native timber industry, how that industry will be sustained and the contribution it makes to the wider regional economy.

### LAND RENTAL

State forests in Monaro Region offer land rental opportunities such as bee keeping (apiary) and grazing of

domestic stock. Much public infrastructure associated with communication, electricity distribution, and local government services generally have been located on State forests. Most of these are let under Occupation Permits.

### Apiary

Forests NSW has developed, in conjunction with the apiary industry and the Department of Primary Industries (DPI), an apiary discussion paper to guide apiary activities on State forest areas. Within the landscape, there appears to be little ecological impact from farmed bees. However, some risk of impact on native flora and fauna exists from escaped bees forming feral populations.

Forests NSW issues permits which allow an apiarist to set down hives in a defined area unencumbered by other apiary activities. The permit area is generally a 1.5 x 1.5 kilometre square.

Honey production from Monaro Region forests is very limited. Only the Moss Vale forests have regular sites and these amount to around 17 sites per year. Although the planted forests offer little utilisable nectar or pollen resource, sites are easily accessible and provide a base for bees to forage in adjacent native forest areas.

Forests NSW will encourage beehives to be sited in Forest Management Zones (FMZ) 3B, 4, 5, 6, and 7. Where there has been historical use of FMZ 1, 2 and 3A and special management zones (*see Part 4: Nature Conservation*) for siting bee hives this may continue with the approval of the Regional Manager. No new set down sites will be established in FMZ 2, FMZ 3A and special management zones and set down will be precluded from FMZ 1 areas. Forests NSW does not encourage sites to be located adjacent to conservation areas managed by NSW Department of Environment and Climate Change (DECC).

### Grazing

Grazing of domestic stock is generally limited to forests with a grassy understorey and a reliable water supply. Type and numbers of stock grazed can be varied to suit the level of development of the planted trees. Grazing in planted forests is used primarily as a fire hazard reduction process.

In forests planted on former improved pasture sites, significant grazing value is available but must be foregone

## Economic Development

until trees exceed 3 m in height or are about four or five years old. Seedlings are then large enough to withstand grazing pressure and physical damage from rubbing. Following canopy closure, at about ten years, there is limited opportunity for grazing.

Any grazing must be compliant with the requirements of the *Rural Lands Protection Act, 1998*, particularly in relation to stock identification and management of notifiable diseases. Grazing opportunities will be let to tender and competitive pricing used in determining successful applicants. Permits and leases are subject to local government and Rural Land Protection Board rates and levies and are generally used to complement private property grazing during times of seasonal shortage.

Forests NSW authorises grazing under a system of permits based on balancing supply and demand. In Monaro Region, about 5,300 ha is under grazing, yielding approximately \$33,000 annually.

### Other

Other land rentals in Monaro Region include those for public infrastructure on State forests. They include towers and beacons for air navigation, radio communication and fire surveillance. High and low voltage electricity transmission lines also occupy a proportion of land.

These areas of regional infrastructure have been classified as FMZ 7 – Non-forestry Use.

## COMMERCIAL TOURISM

State forests offer a wide range of nature-based experiences and complement other tourist attractions within Monaro Region.

Forest based tourism is not a significant contributor to the local economies associated with Monaro forests.

Forests NSW assists businesses to conduct commercial tourism and recreation operations on State forests. They include leasing of old forestry camps (eg Bondi Forest Lodge), bus tours, adventure sports or activities such as bike riding and bush walking from tourist accommodation in close proximity to the forest. Special purpose permits regulate the activities to ensure that they are carried out within the adopted ecological framework.

Forests NSW encourages accreditation of tour operators under ecotourism certification programs and membership of associations with appropriate codes of conduct.

Some activities conducted by community groups are highly organised regional, state and national events such as car rallies, horse endurance rides, motor cross, mountain bike events and orienteering. These events are held under the authority of special purpose permits, which contain conditions addressing environmental protection and personal safety. Additional costs are incurred, associated with supervision to ensure asset protection and environmental and participant safety: these activities are facilitated by Forests NSW more as a social obligation than as an economic enterprise.

Forests NSW does not generally allow exclusive use of forests. However, where worthwhile recreational pursuits cannot be accommodated on other land tenures, and safety of other forest users is an issue, small areas of State forest may be allocated under term permit or temporary licence.

## COOPERATIVE MANAGEMENT OF TOURISM AND RECREATION

Forests NSW, in cooperation with major recreation and tourism groups that use State forests, has developed a State-wide long-term strategy for sustainable tourism and recreation.

Development of the policy and strategic framework document *Living, working, playing ... forests* has been consistent with *Towards 2020: New South Wales tourism masterplan* and *Nature in tourism: A vision for New South Wales 2002-2005*. Forests NSW will also work with Aboriginal communities to identify and facilitate cultural heritage tourism opportunities (see *Part 2: Aboriginal Cultural Heritage*).

Forests NSW will continue to work in partnership with commercial tourism operators, the community, tourism agencies and other government departments to maximise the community benefit of tourism and recreation from State forests.

### FOREST MATERIALS AND PRODUCTS

State forests contain current and potential hard rock, sand and gravel resources (materials), which are managed under the provisions of the *Forestry Act, 1916*, *Environmental Planning and Assessment Act, 1979* and the *Mining Act, 1992*. Gravel quarry sites are generally less than 2 ha and are used intermittently by Forests NSW and some local governments to obtain gravel for road base and pavement dressing to create all weather roads and to protect water quality.

There is limited collection generally of forest products (craft wood, firewood, fence posts, seed etc) within Monaro Region where they represent <1% of the annual revenues. Forests NSW will authorise harvesting of forest products in areas which have been planned for timber harvesting (see *Part 6: Sustainable Timber Supply*) and when harvesting is consistent with ESFM.

Forests NSW will encourage traditional and commercial Aboriginal use of forest products as identified in Part 2: *Aboriginal Cultural Heritage*.

### ECOLOGICAL FRAMEWORK

The ecological framework within which economic benefits are derived is largely described in *Part 6: Sustainable Timber Supply*. Environmental legislation ensures that the ecological framework can be legally enforced, if necessary, and is embodied in the *P&R Code*.

All commercial operations are authorised under the *Forestry Act, 1916* and all relevant licences are conditioned to specify best management practice to protect the environment. All operations are consistent with the *P&R Code*.

As part of the legal framework, Forests NSW licences all commercial harvesting operators and their employees working in the forest to ensure they have an appreciation of the environmental values of the forest and that they are appropriately trained and competent to carry out their work and protect ecological systems and processes.

Table 4: Commercial products sold from State forests in Monaro Region

Commercial Enterprise	How Authorised	Unit	Quantity
Structural grade sawlogs	Timber licence	Cubic metre	192,600
Low quality sawlogs	Timber licence	Cubic metre	39,900
Pulpwood (domestic)	Timber licence	Tonnes	13,700
Pulpwood (export)	Timber licence	Tonnes	75,600
Preservation and fencing (post)	Timber licence	Cubic metre	39,600
Firewood - domestic	Timber licence	Tonnes	208
Gravel/ sand/ rock	Forest materials licence	Tonnes	310
Grazing – annual renewal	Occupation permit	Hectares	1,258
Grazing – short-term	Grazing permit	Permits	29
Apiculture	Bee permit	Sites	17
Research	Special purpose permit	Number	2
Communication Sites	Occupation permits	Number	8
Transmission lines / cables / pipelines	Occupation permit	Kilometre	11

Notes: 30t Authorisation may replace Licences when operations are small scale and of a finite nature.  
 Figures from sales during the 2004/2005 financial year.

# Part 8: Social Development

## POLICY

Forests NSW will, within ecological constraints and subject to using forests for other purposes, maximise its contribution to the social wellbeing of the communities of Monaro Region.

## BACKGROUND

The *National Forest Policy Statement* (NFPS) recognises the value of forests to provide employment, recreation, education and public awareness opportunities.

*Plantations for Australia: The 2020 vision* recognises the social and environmental changes occurring in regional Australia and the role plantations can play in the community. It sees job creation and an increase in farm incomes, as a result of farm forestry, as just some of the social benefits of plantation development.

Within the Monaro regional landscape, State forests form a mosaic with other land tenures, which may be impacted by forest management activities. To minimise any adverse impacts and to maximise beneficial outcomes of management activities, Forests NSW seeks to be an active participant in regional consultative committees and other community forums relating to planted forests.

An extensive network of roads and trails throughout the State forests of Monaro Region enables access for the broader community to a host of recreational, educational and cultural areas of interest.

Entry to State forests is almost invariably free. Where appropriate, facilities have been provided to enhance the opportunities for enjoyment of these special areas. Occasionally, a part of the State forest may be closed because of concerns for public safety, high fire danger, or road conditions.

## REGIONAL DEVELOPMENT

A study has examined the relationship between employment, population change and the plantation sector in Australia's rural regions. The number of family farms have tended to decrease, due predominantly to amalgamation and increases in farming efficiencies, leading

to a corresponding decrease in rural Australia. At the same time, plantation industries in the Monaro landscape have been establishing, expanding and maturing. The plantation industry in the Monaro Region exhibits features of the expanding and maturing phases, which are associated with stabilisation, or increases in regional rural employment (Bureau of Rural Sciences, 2005).

Plantations and associated processing facilities enable diversification of regional economies, with associated benefits of employment and service provision. The *2020 vision* anticipates farm forestry has the ability to increase farm income by as much as 20%, with farm forestry in high rainfall zones having the potential to contribute up to \$664 million annually to farm incomes.

The harvesting, processing and transport industries associated with plantations are those most likely to grow as a result of expansion of the plantation sector. The economic benefits of these industries will largely be retained within the regional centres.

Forests NSW aims to address issues brought about by changes in land use by:

- liaising with local councils and participating in Local Environment Plans (LEP), and
- informing communities of the strategic role of plantations in timber and fibre supply, available employment opportunities and environmental benefits of planted forests.

## EMPLOYMENT

Forests NSW employs 38 people to manage and administer the State forests of Monaro Region. It is estimated that a further 320 people are directly employed in the industries, including establishment, tending and harvesting, that is largely dependent on these forests.

For every direct job in the plantation sector in a transition/mature phase, it is estimated that a further 0.65 to 1.3 jobs are created within the Region, as well as a further flow on beyond the region (Bureau of Rural Sciences, 2005).

Studies have shown employment in the plantation sector to be relatively stable, contrasting significantly with the



## Social Development

agricultural sector despite periods of lower demand for timber products and the rapid increase in the volume of timber harvested.

Future planted forest business, including additional establishment and sales of timber from areas managed by Forests NSW, are not anticipated to provide additional direct employment by Forests NSW.

### ROADS AND REGIONAL INFRASTRUCTURE

Planted forests managed by Forests NSW are extensive and an integral part of the landscape of Monaro Region. These forests contain highways and rural roads and easements for transmission lines, telecommunication lines, gas pipelines and telecommunications towers. Forests NSW will continue to facilitate the delivery of infrastructure for regional development.

The road network within Monaro Region covers 2,717 kilometres and is comprised of 393 km all weather roads and 2,324 km of dry weather only roads including four wheel drive fire trails. Forest roads have an asset value of \$6.5 million and Forests NSW spends about \$380,000 each year to maintain the asset, facilitate harvesting and protect soil and water values.

The road network primarily provides access for plantation establishment and maintenance, harvesting and fire protection. Roads are managed to the standard in the *Plantations and Reafforestation Regulation (P&R Code), 2001* and commensurate with efficient and effective haulage of forest products.

Roads and trails provide access and are used as control lines for hazard reduction burning and wildfire suppression activities.

The road network also provides access for recreation and other forest use such as tourism, apiary, grazing and forest product collection. Harvesting of timber from planted forests generates high traffic volumes of heavy vehicles. Where there is potential for conflict between harvesting and recreation traffic Forests NSW uses signposting to warn of dangers and to regulate traffic.

In some cases, forest roads are used to provide access to neighbouring properties. Any road works must be approved by Forests NSW and follow best environmental practice.

The standard of many forest and local government roads, while being appropriate at the time of construction, are no longer adequate to cope safely with the changed nature and volume of traffic. Where excessive traffic volumes are generated by harvesting, Forests NSW responds on a case by case basis to concerns and proposals from local government for road improvement works. Contributions from Forests NSW are negotiated on a commercial basis.

Research in a number of forested catchments has indicated that roads in otherwise undisturbed forest areas are the greatest contributor to stream turbidity and that this is largely caused by direct connectivity between bare soil surfaces and concentrated flow channels.

The *P&R Code* has identified water quality protection outcomes. The *P&R Code* is further supported by Forests NSW *Forest Practices Code, Part 4 – Forest Roads and Fire Trails, Technical Guidance Notes for Road Works* and *Forest Soil and Water Protection Manual for forestry operations*.

Inappropriate use of roads and tracks by recreational vehicles such as motor bikes and four wheel drive vehicles can cause soil erosion and water pollution. Forests NSW liaises with organised groups, carries out educational programs and cooperates with NSW Police enforcement programs to foster appropriate and safe use of the forest.

Forests NSW has developed the *Monaro Region Road Management Plan* incorporating a measure of environmental risk assessment procedures, priorities for road management programs and instructions on the development of annual schedules of road works.

Forests NSW requires organisations that provide regional infrastructure through State forests to address ecological sustainability in any new proposals or maintenance works. Forests NSW may regulate the use of forest roads for commercial private use by the issue of a special purpose permit.

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### WATER

Water flowing from State forests is critical in maintaining stream-based ecosystems and, in many cases, for supplying water for human and stock consumption downstream of the forest.

The quality and quantity of streamflow (the residual of rainfall minus evapotranspiration) is the result of an interaction between rainfall, climate, soils, geology and land cover.

Water from a number of State forests in Monaro Region contributes to the water supply systems supporting communities in the Central and Southern Highlands.

Rivers from which domestic water supplies are drawn in Monaro Region and where State forests form part of the catchment include:

- Shoalhaven River
- Wollondilly River
- Bombala River, and
- Bundanoon Creek.

Planted forests comprise only a very small part of the catchments for these supplies. Forests NSW does not obtain any commercial benefit from water that flows from State forest areas and is harvested by water supply authorities.

Studies show that where previously cleared land is reforested, water yield declines progressively for about 11 years. This decline stabilises until the plantation is thinned or harvested. Net change in streamflow from a catchment, compared with its original land use, depends on the proportion of the catchment planted, plantation age classes and temporal patterns of thinning and harvesting. It is difficult to detect an impact on streamflow when less than 20% of the catchment is affected by either clearing or reforestation (Forest and Wood Products Research and Development Corporation, 2004).

Water quality is critical to maintaining aquatic ecosystems and reducing the costs associated with water reticulation.

Forests NSW aims to prevent soil erosion and water pollution during forestry activities by:

- minimising soil disturbance by selecting appropriate techniques for site preparation and harvesting
- limiting concentrated flows over disturbed soils
- breaking continuity between soil disturbance and concentrated flow channels
- reducing velocity of overland flows and maximising deposition of any suspended soil particles, and
- applying strict controls to any chemical use within State forest areas (see *Part 5: Forest Health*).

Activities in State forests in Monaro Region are not expected to adversely impact on water yield or quality owing to:

- the very small percentage of plantation within the catchment areas
- the dispersal of activities across the Region, and
- strict soil erosion and water quality protection conditions applied to all operations on State forest.

### LANDUSE

An increase in the rate of recent expansion of the plantation estate in the Bombala area has given rise to concerns that planted forests are causing unacceptable disruption to the social structure of the area. Communities associate this change in land use with a decrease in population as farming families leave the area, with an associated loss of services, as well as the loss of productive farming land. The NSW Government established a reference group to develop a plantations landscape strategy who provided information papers as a background to their deliberations. While this study provided a useful scoping exercise covering the land use and community issues surrounding plantations, a final strategy has not been produced.

Changes in regional Australia have been occurring for some time, evidenced by an increase in mechanisation of broad acre farming, an increasing dependence on "off-farm" income and, in many areas, the spread of "rural lifestyle" development. These all contribute to land use conflict, with changing expectations of 'new' rural populations clashing with pre-existing primary industries. The development



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of the planted forest estate is not responsible for these changes, although it may play a role in the process.

Forests NSW actively engages with local government and other regulatory bodies addressing strategic land use planning issues within Monaro Region. Consultation processes include:

- liaising directly with local government bodies and elected officials on specific issues
- developing submissions supporting the development of local planning instruments including; Local Environment Plans, Development Control Plans, Local Environment Studies and Land Use Strategies
- working within the DPI Regional Relations Team to influence regional departmental outcomes, and
- working with other Government departments (notably the Department of Planning) on specific issues.

### FOREST RECREATION

One of the objects of the *Forestry Act, 1916* is to promote and encourage the use of State forests for recreation. The unique opportunities for recreation provided by State forests stems from their long history of use and protection, the provision of roads and trails and ready public access.

The forests of the Moss Vale group experience very high visitation from wide ranging groups largely due their proximity to Sydney. A recent survey placed Belanglo, Penrose and Wingello State Forests in the top 20 visited forests in NSW. Bombala forests, although significantly larger in extent, experience very low levels of visitation.

State forests provide opportunities for individuals, families and community groups such as primary and secondary school and university students, scouting organisations, clubs and senior citizen groups to enjoy an extraordinarily wide range of recreational pursuits including:

- motor vehicle based – touring/sightseeing, four wheel driving, picnicking, camping, registered motorbike riding, community gatherings including weddings
- self propelled – cycling, mountain bike riding

- animal based - horse riding, dog walking, dog sledding, carriage driving
- pedestrian – bushwalking, abseiling, rock climbing, fossicking, orienteering
- water based – rafting, boating, canoeing and kayaking, fishing, and
- nature based – photography, painting, bird watching and other wildlife observation, botanical studies.

Planted forests also offer a microhabitat particularly well suited to an array of unusual and edible mushrooms which generates keen interest in the fruiting season.

In planted forests the high level of industrial activity associated with timber production can create a potentially dangerous environment for the forest visitor. Forests NSW uses signs in the field and has issued pamphlets in a number of different languages to promote safe use of the forest by visitors.

In conjunction with industry and community groups, Forests NSW reviewed its recreation policy and developed the long-term sustainable recreation and tourism policy and strategic framework document *Living, working, playing ... forests* (see *Part 7: Economic Development*).

Forests NSW publishes recreation resources on the internet site: [www.forest.nsw.gov.au/recreation](http://www.forest.nsw.gov.au/recreation)

### RECREATION FACILITIES

Forests NSW maintains an extensive road network for forest management purposes that also provides public access to State forests of the Monaro Region. Sign posting is used in the forest to provide direction and promote safety for all forest users.

Establishment and maintenance of recreation facilities is generally funded by NSW Treasury as a community service obligation, but is supplemented by Forests NSW to ensure areas of high recreation values are recognised under the Forest Management Zoning (FMZ) system.

Within Monaro Region the small (2,500 ha) Moss Vale group of forests experiences very high visitor pressures largely due to their proximity to major population centres.



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Most of the activities revolve around the road access provided by the plantation but some use the native forest adjacent to the plantations.

The Captain's Flat forests are also small (1,500 ha) in relation to the surrounding native forest and don't support any significant recreational activity peculiar to them.

The large bulk of the Region's planted forests, at Bombala, are relatively remote from larger population centres other than Canberra, which is over two hours away. Recreation in these forests has tended to be very low key and centred around a former forest camp, Bondi Forest Lodge, that is managed under lease to provide basic accommodation. A mountain bike track system through the forest has been developed in conjunction with Bondi Lodge.

Forests NSW will, in conjunction with community groups, review the standard of its recreation facilities to assess whether sites should be developed or dismantled. Priority will be given to developments that enhance visitor enjoyment, prevent environmental damage, provide for personal safety and opportunities for education and involve partnerships with community groups and for which external funds are available.

Toilet facilities within State forests are managed under clause 45 of the *Local Government (Approvals) Regulation 1999*.

Recreation sites and facilities for Monaro Region are listed in *Table 5*.

### EDUCATION

State forests are a vast and easily accessed series of classrooms ideal for formal and informal education on the natural environment and human use of its natural resources. They provide a tactile environment that constantly reinforces instruction and heightens the learning experience.

For many people the size and extent of the forests and its components are awe-inspiring and foster an appreciation and enjoyment of the natural environment. Some people become more aware of the components of the forest, the animals, plants and ecosystems, and how we rely on

them for shelter and quality of life. Information about our interaction with the forest and how the forests react to management often challenges previously held perceptions and provides a basis for informed discussion.

Education within Forests NSW will be guided by the *Learning for Sustainability* document produced by the NSW Council on Environmental Education.

Formal education at primary, secondary and tertiary levels can occur with students participating in school curricula, field trips and case studies of ecologically sustainable development. They can study the role that forests play in improving water and nutrient cycles, reducing salinity, improving biodiversity and moderating greenhouse gas accumulation. Forests NSW staff often assist in delivery of these formal education programs.

Forests are regularly used as a teaching resource and venue for field based excursions for major universities in and adjacent to Monaro Region. Forests NSW works with educational institutions to encourage and facilitate this use. Forests NSW staff participate in the formal learning process at all levels and work cooperatively with government and community institutions on key environmental education initiatives.

Informal education opportunities offered by Forests NSW include community participation, recreation, guided activities, vocational training, publications, the Forests NSW Information Centre (Ph: 1300 655 687), library and internet site [www.dpi.nsw.gov.au/forests](http://www.dpi.nsw.gov.au/forests) and through casual meetings and recreational activities. Signposted walks and accompanied tours all add to the awareness and the natural learning experience.

### MINING

State forests are generally "exempted areas"<sup>1</sup> under the *Mining Act, 1992*. However, authorities that may be granted over State forests include exploration licences, mining leases, assessment leases and mineral claims. NSW Department of Primary Industries - Mineral Resources Division (DPI – Minerals) controls activities under these

<sup>1</sup> Exempted areas include declared State forest areas. The holder of an exploration licence may not, except with the consent of the Minister, exercise any of the rights conferred by the licence within land in an exempted area. Such consent may be given either unconditionally or subject to conditions.



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authorities using lease and licence conditions designed to protect environmental values on State forest.

In recognition of very high conservation values, some flora reserves have been excluded from the provisions of the *Mining Act, 1992*.

Fossicking may be allowed in some areas of State forests with the consent of the Regional manager, but generally a special purpose permit is required.

Mining is permitted in informal reserves – Special Management Zones - and other FMZ with the proviso that it follows standard environmental impact assessment and development approval processes. Mining is authorised and regulated by DPI – Minerals.

There is little evidence of past mining activities in Monaro Region plantations. However, the Moss Vale forests, which lie on valuable sand reserves, are currently under consideration for sand extraction as a resource for the local and Sydney market.

### HUNTING

Hunting is permitted on State forests that have been declared under Section 20 of the *Game and Feral Animal Control Act, 2002*. The hunter must belong to an accredited hunting association and obtain a restricted hunting licence from the NSW Game Council. Hunting on State forests covers the game and feral animals listed in the *Act*. Aboriginal people may take protected species but not threatened species for personal or cultural use under the *National Parks and Wildlife Act, 1974*.

Forests NSW will not permit recreational hunting using poisons, explosives (other than in firearms), snares, steel-jawed traps, lures or spears. Hunters using firearms must be licensed under the *Firearms Act, 1996*.

All enquiries regarding hunting within State forests and the administration of the *Game and Feral Animal Control Act, 2002* should be directed to the NSW Game Council on Ph: 02 6360 5100 or via the web site: [www.gamecouncil.nsw.gov.au](http://www.gamecouncil.nsw.gov.au)

### OTHER SOCIAL BENEFITS

The defence forces regularly use State forests in Monaro

Region, principally the Moss Vale group, for military training purposes. Special purpose permits are issued to regulate military use and protect the environment.

Timber harvesting, thinning and natural tree fall in the forests leaves much woody debris on the forest floor. Where this is not required to maintain ecological communities and processes, Forests NSW licences members of the public to collect it primarily as firewood for domestic use.

### CORPORATE CITIZENSHIP

Forests NSW manages forests in the rural landscape on behalf of the people of NSW and recognises that, to be most effective, management activities designed to protect social, economic and environmental values must be cooperative and coordinated.

Staff of Forests NSW are highly trained and experienced in natural resource management. The organisation will continue to actively participate in, or make contributions to, regional and district committees involved in planning and delivery of bush fire management, weed management, pest animal control, water management, vegetation management and coordination of government services.

Forests NSW values good relations with its neighbours. Although exempt from the provisions of the *Dividing Fences Act, 1991*, Forests NSW assists fencing of boundaries, particularly the boundaries of planted forests.

Planted forests are vulnerable to damage from fire, particularly high intensity fire. Forests NSW takes an active role in the suppression of wildfires both on State Forests and adjacent lands (see *Part 5: Forest Health*).

Additionally, Forests NSW is forming partnerships with community groups to develop strategies for joint delivery of environmental programs on State Forests (see *Part 10: Consultation, Monitoring and Reporting*).

### PUBLICATIONS

Forests NSW has produced the forest map series, which is an excellent reference tool for people wishing to explore the Monaro forests. In addition to highlighting areas of interest, these maps provide a wide range of interesting background

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information about the history and current usage of the forests. In 2007, the revised edition of the popular *Best Bush Map*, a guide to recreational opportunities on all public lands in NSW, was released.

Forests NSW provides a series of interpretive pamphlets for specific recreation attractions and the *Bush Telegraph*, a quarterly magazine highlighting Forests NSW involvement in natural resource management and use.

Forests NSW publishes educational resources including kits, worksheets, posters and research papers, most of

which are available free of charge online at: [www.dpi.nsw.gov.au/forests](http://www.dpi.nsw.gov.au/forests)

Forests NSW has also developed information brochures for a wide range of natural resource management issues including: greenhouse gas accounting, salinity, mine site rehabilitation and biodiversity enhancement.

Table 5: Recreation sites, opportunities, facilities and visitation

Recreation facility	State forest	Opportunity						Facilities					Comment	
		Picnic	Bush	Swim	Camp	View	Drive	Table	BBQ	Track	Toilet	Sign		Other
Daley's Creek	Belanglo	•	•		•		•		•		•			Clearing in pine forest
Bondi Forest Lodge	Bondi	•			•		•			•	•	•		Rental property and bike track
Woolingubrah Inn	Coolangubra												•	Historic inn
HQ Camp	Wingello	•	•		•		•	•	•		•			Small camping area in pines
Penrose Rest Area	Penrose	•					•	•	•		•	•		Highway rest stop



# ESFM

## Part 9: Forestry Operations

### POLICY

Forests NSW will use adaptive management processes to ensure forestry operations within Monaro Region are ecologically sustainable and are conducted in a safe manner.

### BACKGROUND

The *National Forest Policy Statement (NFPS)* recognises that forests and the forest products industry are inherently dangerous, that reforms are necessary to improve workplace health and safety and that a skilled and safety-conscious workforce enhances efficiency and adaptability to change.

Forests NSW recognises that, in managing forests and meeting community needs for economic and social development, there is potential for environmental impacts that may affect ecological sustainability and need to be managed to have acceptable environmental outcomes.

All forestry operations fit within an environmental management framework as identified in the Environmental Management System<sup>1</sup> developed by Forests NSW and within other strategies of this ESFM Plan.

The *Plantation and Reafforestation Act, 1999 (P&R Act)* and *Plantations and Reafforestation Regulation (P&R Code), 2001* applying to planted forests provides the principal regulatory framework for environmental planning, assessment and implementation of plantation operations.

The adaptive management process used by Forests NSW employs the best available knowledge and practices. Adaptive management principles are used in all forestry operations and underpin every part of the continuous improvement cycle.

*Forests NSW Forest Practice Code, Part 1 – Timber Harvesting in Plantations, Part 3 – Plantation Establishment and Maintenance, and Part 4 – Forest Roads and Fire Trails* provide non-site specific instructions for these activities.

Operational plans are prepared for all major forest activities and contain site specific instructions designed to permit

<sup>1</sup> The Environmental Management System establishes a framework for decision making that is documented, transparent and fully accountable and ensures that timber production from planted forests is ecologically sustainable.

the activity while protecting natural and cultural environment values. During operations, plans are amended where necessary to maintain environmental values.

Operational monitoring ensures compliance with plan conditions and, where non-compliance occurs, assesses environmental harm and details necessary repair works, the cause of non-compliance, whether sanctions are necessary and how the non-compliance can be avoided in future operations.

The degree of operational planning, supervision, monitoring and reporting is reliant on the:

- nature and intensity of operations and the potential environmental impacts
- nature and sensitivity to disturbance of the natural and cultural environment, and
- availability of scientific knowledge to assess and ameliorate potential impacts.

### WORKPLACE HEALTH AND SAFETY

The NSW Government has implemented legislative and regulatory reforms through the *Occupational Health and Safety Act, 2000*, the *Occupational Health and Safety Regulations, 2001* and the *WorkCover NSW Code of Practice for Safety in Forest Harvesting Operations (2002)*.

Forests present an inherently dangerous work environment and forest harvesting can be an especially hazardous occupation.

Forests NSW has developed and implements a safety management system that aims to ensure the health and safety of Forests NSW staff and ensures that the health and safety of other forest workers and visitors to the forest are not put at risk.

Forests NSW Workplace Safety Policy commits the organisation and its managers, supervisors and employees to provide a safe and healthy work environment through the implementation of various strategies and commitments.

To give effect to the policy, Forests NSW has developed the detailed *Workplace Safety Management System* that is reviewed on a three yearly cycle and that:

- identifies key NSW occupational health and safety legislation, Australian standards and codes of practice, and
- details the processes and procedures Forests NSW management, at all levels, will develop, document, implement and monitor to ensure the safety of employees, contractors and other forest workers as well as visitors in our workplaces.

Forests NSW has also developed a set of *Forest Workplace Safety Standards* that continue to evolve through consultation and innovation and which provide best practice safety standards and procedures for the effective management of specific workplace issues or activities.

Forests NSW requires site specific safety plans for its forest operations which:

- identify and assess workplace hazards and establish control measures to minimise those workplace hazards
- identify responsible supervisors, and
- detail site-specific medical emergency procedures.

Forests NSW operational plans identify hazards, suggested controls and emergency planning information. This facilitates the mandatory development a site safety plan by the contractor for their forests work sites.

All staff within Forests NSW and contractors receive a copy of and instruction in the *Workplace Safety Management System*. A Forests NSW Field Supervisor's safety training course is in development.

The Monaro Region Health and Safety Committee addresses local safety issues, and there is a Planted Forests representative on the Corporate Safety Advisory Team. Safety and training coordinators assist regions in implementation of workplace safety management.

## TYPES OF OPERATIONS

Forestry operations are assessed in terms of their interaction with environmental variables and a determination of appropriate ameliorative measures.

Forests NSW has completed an analysis of forestry

operations and determined that those operations having the greatest potential for environmental impacts comprise:

- activities associated with establishment of planted forests (see *Part 6: Sustainable Timber Supply*)
- chemical use, for example pest animal management and weed control (see *Part 5: Forest Health*)
- timber harvesting involving tree felling, log extraction and log haulage (see *Part 6: Sustainable Timber Supply*)
- road construction and maintenance, particularly drainage feature crossings and side cuts on steep side slopes (see *Part 8: Social Development*), and
- fire management including fuel hazard reduction burning; particularly in ecologically sensitive habitats and streamside buffers (see *Part 5: Forest Health*).

These operations require planning, supervision and monitoring.

Other operations, which have lesser potential for environmental impacts, have been recognised and addressed in other parts of this ESFM Plan or in supplementary plans. They include:

- recreation facility construction and maintenance (see *Part 8: Social Development*)
- response to disease and wildfire (see *Part 5: Forest Health*)
- collection of forest products and materials (see *Part 7: Economic Development*)
- pest animal control (see *Part 5: Forest Health*)
- grazing (see *Part 7: Economic Development*), and
- apiary (see *Part 7: Economic Development*).

## ANNUAL SCHEDULES

Operations to be undertaken on State forests are generally set out in supplementary plans, plans of operation or annual programs.

An annual plantation establishment program is undertaken. This may comprise areas of:



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- first rotation sites (1R): areas that have been previously cleared and are to be reforested
- second and subsequent rotation sites (2R): areas that have previously grown plantation, and that have had all merchantable timber removed, and
- land of other tenures on which Forests NSW may operate for third parties.

Harvesting areas are identified in a three year Plan of Operations in which those areas planned for harvesting in the first year have been verified while those identified for later years are indicative. Each year the Plan of Operations is reviewed and updated.

The annual schedule for road construction and maintenance will be determined in accordance with the *Monaro Region Road Management Plan*. Roads requiring upgrading to allow for harvesting and associated haulage are closely aligned with the harvesting *Plan of Operations* while other road works will be scheduled according to potential for environmental harm and personal safety of forest users.

Forests NSW annual schedule for fire fuel management is posted on the Rural Fire Service (RFS) web site via the Bushfire Risk Information Management System (BRIMS) and available to the relevant Bush Fire Management Committee. The schedule is influenced by the need for plantation protection and ecosystem management. Forests NSW will include the season in which it is proposed to burn and frequency, or time lapse between burns that is proposed.

Chemical use is predominantly in the fields of weed control and pest animal control. Weed control programs have two focus points: competition weeds and noxious weeds<sup>2</sup>. A program for the control of competition weeds is developed as part of the plantation establishment program. An annual noxious weed control program and pest animal control program is determined following liaison/ consultation with local and regional management organisations.

Forests NSW uses estate modelling, field inspections, Forest Management Zoning (FMZ), mapped exclusions and known

non-operational areas to ensure the operation is warranted and to determine the nature and extent of the operation.

### ECOLOGICAL FRAMEWORK

For planted forests in Monaro Region the ecological framework and operating conditions are within the *P&R Act* and the *P&R Code*.

These instruments have been developed in recognition of the available information about natural and cultural values, the nature of forest operations and their impacts and how those impacts can be ameliorated to protect environmental values. The *P&R Act* and *P&R Code* identify:

- how operations must be planned and authorised, and
- the way operations are to be carried out to protect environmental values and cultural values.

### ENVIRONMENTAL DATA COLLECTION

Forests NSW assesses existing data when planning for forestry activities to identify whether further information needs to be collected. This allows for assessment of site-specific impacts of the proposed activity and the development of any amelioration measures.

The Geographic Information System (GIS) operated by Forests NSW spatially represents a suite of information including land tenure, FMZ, topography (contours and drainage), soils, steep slopes, forest types, cultural heritage sites, threatened species records, and roads and towns.

Staff also use linked databases that provide a range of information, including stand history and silvicultural status, predicted and actual yields, and both Aboriginal and non-Aboriginal cultural heritage sites.

Where current information is inadequate, additional surveys may be required. All additional data collected is regularly incorporated into Forests NSW databases. This allows strategic and operational planning to be based on the most up-to-date information base. The following paragraphs describe some of this additional information, which may be included in the databases.

<sup>2</sup> Competitive weeds are those that compete directly with plantation seedlings for moisture, light and nutrients. Noxious weeds are those that are declared under the *Noxious Weeds Act 1993*.

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## Flora and Fauna

Where Forests NSW becomes aware that plantation operations are likely to have an impact on “Unique or Special Wildlife Values”<sup>3</sup> as defined in the *P&R Act*, field inspections must be undertaken, recovery plans considered and prescriptions to manage the species must be developed as part of the determination process.

Only trained, accredited staff may carry out surveys. Fauna survey work is monitored by the Animal Care and Ethics Committee<sup>4</sup> and may be audited by NSW Department of Environment and Climate Change (DECC).

## Aquatic Habitat

Where operations will impact on exclusion zones around aquatic habitats of unique and special fish species, site-specific information will be collected and assessed as directed by DPI – Fisheries under the *Fisheries Management Act, 1994*.

It may be necessary to undertake field inspections to assess the aquatic habitat of the watercourses and survey for targeted fish species where potential habitat exists and in-stream works are proposed.

## Soil and Water

Where soil disturbance will occur during establishment and harvesting activities, Forests NSW will comply with the requirements of the *P&R Code*. Additional site specific information will be collected and assessed as directed by DECC through the terms of the licence issued under the *Protection of the Environment Operations Act, 1997*.

Site specific information collection may involve field inspection for:

- soil characteristics such as the ease with which soil particles are detached and transported (soil regolith and dispersible soils), and
- evidence of past or potential mass movement of soil.

Soil assessors must be approved, if required, by DECC.

<sup>3</sup> As defined in the *P&R Act*: any endangered species, endangered ecological community or species presumed extinct within the meaning of the *Threatened Species Conservation Act, 1995* and the *Fisheries Management Act, 1994*.

<sup>4</sup> The Animal Care and Ethics Committee, as constituted under the *Animal Research Act, 1985*, authorises any intrusive procedures.

Approvals may be revoked if the Department finds work of insufficient standard.

This information, together with additional information about the proposed activity, slopes, and total and seasonal rainfall characteristics, helps to define inherent erosion and pollution hazard levels.

## Aboriginal Cultural Heritage

Site specific information will be obtained and Aboriginal cultural heritage values and issues will be assessed using the *P&R Code* and the *Operational Guidelines for the Management of Aboriginal Cultural Heritage on State forests* (see *Part 2: Aboriginal Cultural Heritage*).

Where requested by the Aboriginal community, Forests NSW will respect the confidentiality of known sites.

## Non-Aboriginal Cultural Heritage

Non-Aboriginal cultural heritage sites in addition to those identified in heritage databases will be identified during field inspections and surveys for other values.

## CONSULTATION

Forests NSW will consider the effect of proposed operations on all affected parties, including neighbours.

In timber harvesting operations customers and/or contractors are consulted on site-specific design requirements such as machinery, topographic impediments, log extraction patterns and log haulage routes.

Contact is made with other people including tenants such as beekeepers, graziers and managers of any community infrastructure who may be directly affected by the proposed operation.

Immediate neighbours will be consulted if their vehicular access is affected. Neighbours are also consulted where herbicide application operations are proposed. Where haulage routes are shared with other sensitive traffic, such as school buses, strategies to minimise the risk of conflict are considered and implemented.

Fire fuel management activities are planned in consultation and cooperation with other members of the relevant Bush Fire Management Committees.



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Forests NSW will also consider the reasonable needs of other forest users such as tourists, forest researchers and the military. In some cases, for example to ensure public safety, forest areas may be closed temporarily to the general public.

### PLANNING MANUALS

Forests NSW has developed planning checklists for planted forest establishment and maintenance to ensure compliance with regulatory requirements and consideration of all environmental values in operational planning.

Forests NSW has developed the *Road Works Systems Manual* which recognises best engineering practices and relevant regulatory requirements. The *Planted Forests Harvest Plan Manual* is used to ensure regulatory compliance and consider best management practices.

Planning for fire fuel management operations will be guided by Forests NSW *Corporate Fire Management Plan* and the *Regional Fuel Management Plan*. These plans incorporate the requirements of the *Rural Fires Act, 1997*, *Fisheries Management Act, 1994*, *Threatened Species Conservation Act, 1995* and the *Protection of the Environment Operations Act, 1997*.

Planning for other operations will implement the instructions contained in Regional supplementary management plans.

### OPERATIONAL PLANS

All major operations on State forest, such as establishing planted forests, maintenance activities that involve chemical use, harvesting, roading and fuel reduction burning, are undertaken in accordance with an operational plan.

All collected information is considered within the context of the ecological framework and integrated into a site-specific operational plan.

The operational plan will contain an operational map and, where required, a locality map. These will identify:

- location, extent and boundaries of the proposed activity
- topographic features such as contours, drainage and rocky areas

- areas where the activity is excluded
- any area with additional requirements beyond the general prescription
- sites where specific tasks need to be undertaken, and
- access roads and tracks.

The written section of the operational plan contains, where necessary, details of:

- nature and extent of the activity
- activity objectives
- forest species, stocking, thinning status and, where appropriate, the silviculture to be used
- site specific measures to control soil erosion, minimise transport of soil particles and protect water quality
- site specific measures to protect cultural heritage values, and
- site specific measures to protect unique and special wildlife, and associated habitat.

Standard forms are often used in compiling the operational plan. Operational plans are internally reviewed prior to approval by the appropriate manager. Relevant documentation supporting development of the plan will be available for public inspection.

### OPERATIONAL PLAN IMPLEMENTATION

Each operation has a designated supervisor who is responsible for the implementation of the operational plan.

Prior to the commencement of operations the supervisor, contractors, operators and employees, where necessary, are briefed on the contents of the operational plan to ensure they share a common understanding of the plan's requirements.

Contractors, operators and Forests NSW supervisory staff are required to be trained and accredited to a recognised level of competence (to nationally approved standards where necessary) in the various tasks they undertake.

Training may include:

- soil and water management
- occupational health and safety



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- plant and equipment
- environmental care in the fields of:
  - operational plan implementation
  - Aboriginal and non-Aboriginal cultural heritage management, and
  - forest silviculture, and
- first aid awareness.

As part of the soil and water protection training package<sup>5</sup>, Forests NSW has prepared *Forest Soil and Water Protection: A Manual for Forestry Operators*, which is distributed to all relevant staff and operators.

Supervisors interpret the operational plan and identify sensitive environmental features and exclusion area boundaries in the field. Where necessary, boundaries are marked in the field to ensure recognition by operators and protection of environmental values.

During operations the availability of new information may make it necessary to amend an operational plan. Decisions to amend a plan must be documented and any amendments must be recorded in the operational plan.

## MONITORING AND AUDITING

Supervisors are required to attend operations regularly and to document the components of the work they have checked, as well as the progress of the work.

Any departure from or variation to the work instructions in the operational plan must be recorded. Forests NSW will record any non-compliance with the operational plan conditions and:

- investigate instances of environmental harm and, where appropriate, ensure they are corrected
- try to establish the cause of the non-compliance and apply appropriate sanctions, and
- determine any preventative measures and put them in place.

<sup>5</sup> The International Erosion Control Association gave the package an Achievement Award for commitment to excellence in the conservation of natural resources and environmental protection.

Procedures arising from non-compliance in harvesting are detailed in *Forests NSW Forest Practice Code, Part 1 – Timber Harvesting in Forest NSW Plantations*.

Instances of non-compliance are compiled in a register, which is available for inspection. Non-compliance issues are summarised and reported on an annual basis, or as otherwise required, to external government regulators.

To ensure effective and consistent implementation of operational plans, Forests NSW has a Monitoring and Audit Manual, which outlines the requirements for monitoring and audit of forest operations. In addition to monitoring by the direct supervisor, forest managers, Forests NSW audit specialists or operational specialists, inspect and report on field operations, systems and procedures.

The audit procedure used by Forests NSW is part of the organisations Environmental Management System, and audit results will influence the review of systems and processes.

External government regulators may, of their own volition or at the behest of third parties, audit *P&R Code* or licence implementation including information collection, operational definition, operational plan development, the operations plan and plan implementation. Non-compliance may result in letters, clean-up notices or regulatory action and Forests NSW taking remedial action to modify systems and processes to prevent a recurrence.

Forests NSW maintains a Complaints Register in which public complaints are documented together with action taken to address the complaint.

## RECORDING

At the completion of an activity, the field copy of the plan is returned for data collection and storage.

Operational areas are often scheduled for related follow-up work. For example, recently planted areas may require weed control survival assessment, while clearfall harvest areas are scheduled for re-establishment.

Forests NSW presents annual reports on the details of operations.

# Part 10: Consultation, Monitoring And Reporting

## POLICY

Forests NSW will undertake appropriate and systematic consultation, monitoring and reporting to achieve transparent and accountable professional forest management in the Monaro Region.

## BACKGROUND

The *National Forest Policy Statement* (NFPS) envisages that the “community have a sound understanding of the values of forests and sustainable forest management, and will participate in decision making processes relating to forest use and management”.

*Plantations for Australia: The 2020 vision* explains the partnership between Government and the planted forest growing and processing industry. It recognises the role that planted forests can play in the community and encourages partners to address social and environmental issues related to the expanding resource.

The *Vision* identifies opportunities for extension of planted forest areas onto private lands to diversify the farm resource base or to stimulate regional land markets where large consolidated plantings are required. It also envisages a role for public participation in the development of the planted forest resource.

Forests NSW participates in local and regional studies exploring the environmental and social impacts of planted forest activities. In Monaro Region these issues have been canvassed by the Snowy-Monaro Plantations Landscape Strategy Reference Group (2005).

The comprehensive regional assessment (CRA) process provided the scientific basis for the State and Commonwealth governments to develop Regional Forest Agreements (RFAs) which determined the tenure of the public native forests, providing a balance between conservation and ecologically sustainable use of forest resources. During the CRA process, stakeholders, including relevant agencies, interested individuals and community groups were represented on technical committees and consultative forest forums. There was an active information dissemination program.

Experts and stakeholders, including community interest groups, considered the applicability and adoption of the Montreal<sup>1</sup> criteria and indicators by which to guide and measure progress towards the conservation and ecologically sustainable management (ESFM) of native forests.

Although only a small number of CRA criteria and indicators specifically relate to planted forests, Forests NSW has extended the monitoring and reporting of other criteria and indicators into the planted forests where it is appropriate.

The criteria are broad categories of forest values that, as a society, we want to maintain. The indicators adopted for Monaro Region are based on a nationally agreed framework<sup>2</sup>, are mostly readily measured or described and provide a uniform, objective method of reporting.

The continuous improvement cycle for ESFM is completed by reporting monitoring outcomes and reviewing relevancy of the environmental policy and the efficacy of the ecological framework within which forestry operations are undertaken.

Reports also inform international, national and local communities, regulators and State and Federal parliaments of progress towards ESFM. Australia reports at both a national level (*State of the Forests*) and an international level (*Approximation Report for the Montreal Process*<sup>3</sup>).

## CONSULTATION

Forests NSW has developed a communication strategy for interaction with stakeholders including individuals, customers, community groups and other government agencies. The aim of the strategy is to raise public awareness of environmental aspects and impacts of forestry operations, enable public participation

<sup>1</sup> The Montreal Process comprised an international forum considering boreal and temperate forests to determine criteria and indicators for conservation and sustainable management and culminated in the Santiago declaration in February 1995. Of the 7 criteria, 5 relate to the environment, one to socio-economic use of forests and one to the legal, institutional and economic framework for sustainable forest management.

<sup>2</sup> A framework of regional (sub-national) level criteria and indicators of sustainable forest management in Australia was developed by the Montreal Process Implementation Group (MIG).

<sup>3</sup> The first national report was *Australia's first approximation report for the Montreal Process, June 1997*. Supplements have been published for 2000 and 2001.

in decision-making for forest use and management activities and set out clear and transparent methods for receiving, recording and responding to relevant external communication.

The communication strategy will identify stakeholders, type of communication, communication objectives – information or decision-making, relevant forums and strategies, the responsible officer from Forests NSW and an indication of the frequency of consultation.

Examples of processes that currently involve community consultation include:

- preparing strategies for this regional ESFM plan
- preparing strategic regional plans for the management of establishment of planted forests, road works, pest animals, weeds, fire and grazing
- preparing and reviewing codes of forest practice
- planning fire management through the relevant Bush Fire Management Committees
- preparing and reviewing annual weed management programs through regional weeds committees
- preparing and reviewing annual pest animal management programs through regional wild dog control boards and pest animal committees
- acquiring Aboriginal cultural heritage information through the local Aboriginal community
- planning sustainable use of recreation and tourism attractions through relevant community organisations, and
- preparing and publishing reports such as the *Social, Environmental and Economic (Seeing) Report*, the *Annual Report* and periodicals like the *Bush Telegraph*.

Approved operations plans are available for public inspection.

Forests NSW maintains a hotline for reporting issues on State forests. Voicemail is available on the free call number 1800 102 333 or contact with a Forests NSW officer is available on 02 9872 0520.

## MONITORING

Monitoring of forest management activities across Monaro Region must satisfy local reporting requirements and also be capable of aggregation upwards to satisfy national and international reporting requirements.

Forest conservation and ESFM criteria and indicators are to be monitored across all land tenures in the RFA region. Forests NSW will monitor criteria and indicators on areas of State forest. Other agencies will be responsible for monitoring ESFM criteria and indicators on other forested land tenures.

The Montreal process criteria adopted are:

1. conservation of biological diversity (biodiversity)
2. maintenance of the productive capacity of ecosystems
3. maintenance of ecosystem health and vitality
4. conservation and maintenance of soil and water resources
5. maintenance of forest contribution to global carbon cycles
6. maintenance and enhancement of long term multiple socio-economic benefits to meet the needs of society, and
7. legal, institutional and economic framework for forest conservation and sustainable management.

Consistent with the NFPS the application and relevant importance of the criteria and indicators will vary between tenures and broad forest types. To ensure consistency in data collection for the indicators, Forests NSW has developed standardised data collection and entry to a centralised Social, Environmental and Economic Data Storage (SEEDS) system.

In addition to the agreed sustainability indicators, Forests NSW will continue to monitor:

- performance in cultural heritage management (see *Part 2: Aboriginal Cultural Heritage* and *Part 3: Non-Aboriginal Cultural Heritage*), and
- operational planning and implementation, including contract management, and effectiveness of control in supervision and compliance checking (see *Part 9: Forestry Operations*).



## Consultation, Monitoring And Reporting

### REPORTING

Forests NSW recognises that it has social, environmental and economic responsibilities in forest management and, since 1997, has produced the *Social, Environmental and Economic (Seeing) Report* to enable annual reporting of these elements. The *Seeing Report* incorporates a number of ESFM indicators and, in most cases, can report on trends since 1997.

As a corporate entity, Forests NSW reports annually to the Commissioner for Forests and the NSW Parliament.

Additionally, Forests NSW reports annually to satisfy requirements for:

- National Montreal Process Criteria and Indicators (Department of Agriculture, Fisheries and Forestry – Australia)
- National State of the Forests (National Forest Inventory and Bureau of Rural Sciences)
- NSW State of the Environment Report (Department of Environment and Climate Change (DECC))
- implementation and compliance with regulatory instruments associated with authorisation of planted forest operations (DECC), and

- annual management plan reports under the ESFM plans.

Reports from regions to the Directors, Planted Forest Operations and Land Management and Technical Services branches will also address the relevance of the Environmental Policy, ESFM strategies and may also indicate changes considered necessary to further improve forest management.

Table 6: Montreal Criteria and Indicators to be monitored for Monaro Region

Forest value criterion	Indicator
<b>Conservation of Biological Diversity</b>	<b>1.1 a</b> Area of forest by forest type and tenure
	<b>1.1 b</b> Area of forest by growth stage
<b>1.1 Ecosystem diversity</b>	<b>1.1 c</b> Area of forest in protected area categories
<b>1.2 Species diversity</b>	<b>1.1 d</b> Fragmentation of Forest cover
<b>1.3 Genetic diversity</b>	<b>1.2 a</b> Forest dwelling species for which ecological information is available
	<b>1.2 b</b> The status of forest dwelling species at risk of not maintaining viable breeding populations, as determined by legislation or scientific assessment
	<b>1.2 c</b> Representative species from a range of habitats monitored at scales relevant to regional forest management
	<b>1.3 a</b> Forest associated species at risk from isolation and the loss of genetic variation, and conservation efforts for those species
	<b>1.3 b</b> Native forest and plantations of indigenous timber species which have genetic resource conservation mechanisms in place

## Consultation, Monitoring And Reporting

Forest value criterion	Indicator
Maintenance of Productive Capacity of Forest Ecosystems	2.1 a Native forest available for wood production, area harvested, and growing stock of merchantable and non-merchantable tree species
	2.1 b Age class and growing stock of plantations
	2.1 c Annual removal of wood products compared to the volume determined to be sustainable for native forests and future yields for plantations
	2.1 d Annual removal of non-wood forest products compared to the level determined to be sustainable
	2.1 e Area of native forest harvested and the proportion of that effectively regenerated, and the area of plantation harvested and the proportion of that effectively re-established
Maintenance of Ecosystem Health and Vitality	3.1 a Scale and impact of agents and processes affecting forest health and vitality
	3.1 b Area of forest burnt by planned and unplanned fire
Conservation and Maintenance of Soil and Water Resources	4.1 a Area of forest land managed primarily for protective functions
	4.1 b Management of the risk of soil erosion in forests
	4.1 c Management of the risks to soil physical properties in forests
	4.1 d Management of the risks to water quantity from forests
	4.1 e Management of the risks to water quality in forests
Maintenance of Forest Contribution to Global Carbon Cycles	5.1.a Contribution of forest ecosystems and forest industries to the global greenhouse gas balance
Maintenance and enhancement of long term multiple socio-economic benefits to meet the needs of society	6.1 a Value and Volume of wood and wood products
	6.1 b Values, quantities and use of non-wood products
	6.1 c Value of forest based services
	6.1 d Production and consumption and import/export of wood, wood products and non-wood products
	6.1 e Degree of recycling of forest products
	6.2 a Investment and expenditure in forest management
	6.2 b Investment in research, development, extension and use of new and improved technologies
	6.3 a Area of forest available for public recreation/tourism
	6.3 b Range and use of recreation/tourism activities available
	6.4 a Area of forest to which Indigenous people have use and rights that protect their special values and are recognised through formal and informal management regimes
	6.4 b Registered places of non-Indigenous cultural value in forests that are formally managed to protect those values
	6.4 c The extent to which Indigenous values are protected, maintained and enhanced through Indigenous participation in forest management
	6.4 d The importance of forests to people
	6.5 a Direct and indirect employment in the forest sector
	6.5 b Wage rates and injury rates within the forest sector
	6.5 c Resilience of forest dependent communities to changing social and economic conditions
	6.5 d Resilience of forest dependent Indigenous communities to changing social and economic conditions



## Consultation, Monitoring And Reporting

Forest value criterion	Indicator
<b>Legal, Institutional and Economic Framework for Forest Conservation and Sustainable Management</b>	<b>7.1 a</b> Extent to which the legal framework supports the conservation and sustainable management of forests
	<b>7.1 b</b> Extent to which the institutional framework supports the conservation and sustainable management of forests
	<b>7.1 c</b> Extent to which the economic framework supports the conservation and sustainable management of forests
	<b>7.1 d</b> Capacity to measure and monitor changes in the conservation and sustainable management of forests
	<b>7.1 e</b> Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services

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Australian Forestry Standard	<a href="http://www.forestrystandard.org.au">www.forestrystandard.org.au</a>
Australian Heritage Council (Commonwealth Government)	<a href="http://www.ahc.gov.au">www.ahc.gov.au</a> or <a href="http://www.environment.gov.au/heritage">www.environment.gov.au/heritage</a>
eWater CRC	<a href="http://www.ewatercrc.com.au">www.ewatercrc.com.au</a>
Department of Agriculture, Fisheries and Forestry – Commonwealth of Australia	<a href="http://www.daff.gov.au">www.daff.gov.au</a>
Forest and Wood Products Australia Ltd. (FWPA)	<a href="http://www.fwpa.org.au">www.fwpa.org.au</a>
Forests NSW	<a href="http://www.dpi.nsw.gov.au/forests">www.dpi.nsw.gov.au/forests</a>
Integrated Forestry Operations Approvals (IFOAs)	<a href="http://www.racac.nsw.gov.au/rfa/ifo2.shtml">www.racac.nsw.gov.au/rfa/ifo2.shtml</a>
Legislation – Commonwealth of Australia	<a href="http://www.comlaw.gov.au">www.comlaw.gov.au</a>
Legislation – New South Wales	<a href="http://www.legislation.nsw.gov.au">www.legislation.nsw.gov.au</a>
Montreal Process, The	<a href="http://www.mpci.org">www.mpci.org</a>
National Association of Forest Industries	<a href="http://www.nafi.com.au">www.nafi.com.au</a>
National Forest Policy Statement	<a href="http://www.daff.gov.au/forestry">www.daff.gov.au/forestry</a>
National Indigenous Forest Strategy	<a href="http://www.daff.gov.au/forestry/policies">www.daff.gov.au/forestry/policies</a>
NSW Department of Environment and Climate Change (also includes NSW Council on Environmental Education)	<a href="http://www.dec.nsw.gov.au">www.dec.nsw.gov.au</a>
NSW Department of Planning	<a href="http://www.planning.nsw.gov.au">www.planning.nsw.gov.au</a>
NSW Department of Primary Industries	<a href="http://www.dpi.nsw.gov.au">www.dpi.nsw.gov.au</a>
NSW Greenhouse Gas Abatement Scheme	<a href="http://www.greenhousegas.nsw.gov.au">www.greenhousegas.nsw.gov.au</a>
NSW Regional Forest Agreements – note (archive only)	<a href="http://www.racac.nsw.gov.au">www.racac.nsw.gov.au</a>
NSW Rural Fire Service	<a href="http://www.rfs.nsw.gov.au">www.rfs.nsw.gov.au</a>
NSW Rural Lands Protection Boards	<a href="http://www.rlpb.org.au">www.rlpb.org.au</a>
NSW State Heritage Inventory; NSW State Heritage Register	<a href="http://www.heritage.nsw.gov.au">www.heritage.nsw.gov.au</a>
NSW State Plan	<a href="http://www.nsw.gov.au/stateplan">www.nsw.gov.au/stateplan</a>
NSW WorkCover	<a href="http://www.workcover.nsw.gov.au">www.workcover.nsw.gov.au</a>
Plantations for Australia: The 2020 Vision	<a href="http://www.daff.gov.au/forestry">www.daff.gov.au/forestry</a>
Regional Forest Agreements	<a href="http://www.daff.gov.au/rfa">www.daff.gov.au/rfa</a>
Register of the National Estate, The (part of the Australian Heritage database)	<a href="http://www.environment.gov.au/heritage/ahdb">www.environment.gov.au/heritage/ahdb</a>
Standards Australia	<a href="http://www.standards.com.au">www.standards.com.au</a>
Tourism NSW	<a href="http://corporate.tourism.nsw.gov.au">corporate.tourism.nsw.gov.au</a>
World Conservation Union (IUCN)	<a href="http://www.iucn.org">www.iucn.org</a>

# Relevant Acts and Legislation

Animal Research Act, 1985  
Crown Lands Act, 1989  
Dividing Fences Act, 1991  
Environmental Planning and Assessment Act, 1979  
Environment Protection and Biodiversity Conservation Act, 1999 (Commonwealth)  
Firearms Act, 1996  
Fisheries Management Act, 1994  
Forestry Act, 1916  
Forestry and National Park Estate Act, 1998  
Game and Feral Animal Control Act, 2002  
Heritage Act, 1977  
Local Government (Approvals) Regulation, 1999  
Mining Act, 1992  
National Park Estate (Reservations) Act, 2002  
National Park Estate (Reservations) Act, 2003  
National Parks and Wildlife Act, 1974  
Native Title Act, 1993 (Commonwealth)  
Native Vegetation Act, 2003  
Noxious Weeds Act, 1992  
Occupational Health and Safety Act, 2000  
Occupational Health and Safety Regulation 2001  
Pesticides Act, 1999  
Plantations and Reafforestation Act, 1999  
Plantations and Reafforestation Regulation (P&R Code), 2001  
Protection of Environment Operations Act, 1997  
Rural Fires Act, 1997  
Rural Lands Protection Act, 1998  
Threatened Species Conservation Act, 1995



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