FOREST MANAGEMENT PLAN

FOR THE

NORTH EAST

Department of Natural Resources and Environment

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FOREWORD

The forests of the North East extend from the tall, wet forests along the Great Dividing Range to the foothill forests and plains woodlands to the Murray River in the north and west. The regional centres of Benalla, Wangaratta and Corryong are within the North East planning area. The forests in the region contain important environmental and cultural values and economic resources that form the basis for a thriving tourism industry, sustainable timber industry and which provide valuable water resources.

Over 1.2 million hectares within the planning area of 2.3 million hectares is public land, of which more than 428 000 hectares is set aside in parks and conservation reserves. The recent additions of the Wongungarra River headwaters and the Wongungarra Remote and Natural Area to the Alpine National Park ensures that significant forest values in these areas will be protected. This Plan applies to State forest, which extends over approximately 697 000 hectares. The State forest complements the parks and reserve system by playing a major role in conserving the area's natural values, as well as contributing to the regional and State economy.

This Plan establishes management principles for the balanced use and care of State forest. These management principles are consistent with the Victorian Government's commitment to ecologically sustainable forest management. This Plan aims to provide an environment where forest ecosystems are maintained or enhanced, water supplies and sensitive environmental and cultural values are protected, and timber production, recreation and other forest uses can continue to benefit local communities.

In preparing this Plan, NRE has adopted an integrated regional planning approach that is based on a wide range of expertise from within and outside NRE. Public participation has been integral to the development of this Plan. A Forest Management Advisory Committee, drawn from local communities and key stakeholder groups, has advised the planning team on key community issues and concerns regarding forest management and has provided valuable comment. NRE sought the views of a wide range of interested people in order to address the issues that have been raised. NRE also considered the views of many individuals and groups in the development of the 1999 North East Regional Forest Agreement which ran concurrently with the development of this Plan.

This Plan is consistent with the North East Regional Forest Agreement and the recent additions to the Alpine National Park and provides a blueprint for the sustainable management of public forests in north eastern Victoria.

Chloe Munro
Secretary

SUMMARY

Publicly owned forest in the North East covers more than 1.1 million hectares, extending from the Murray River to the east and north, the Hume Highway to the west and the Great Dividing Range to the south. State forest comprises approximately 697 000 hectares of this land and has an important role in complementing the management of national parks and other reserves for conservation, recreation and the tourism industry. State forest also contributes to Victoria's annual sawlog harvest and encompasses catchments from which local communities draw clean water supplies.

The major challenges addressed in this Plan are to meet a number of conservation and resource use requirements, including those of the *Flora and Fauna Guarantee Act* 1988, the *Heritage Rivers Act* 1992, the *Catchment and Land Protection Act* 1994, the *National Forest Policy Statement (NFPS) (Commonwealth of Australia 1992a)*, current sawlog licence commitments to the timber industry and the sustainable yield requirements of Schedule 2 of the *Forests Act* 1958. The strategy used to address these challenges has three main elements.

Conservation guidelines specify minimum levels of planned protection to be provided for natural values in State forest, taking into account the extent of those values in national parks and conservation reserves. They provide a systematic basis for zoning decisions in State forest and therefore introduce stability into the process for balancing conservation with timber production goals.

Forest management zones set priorities and permitted uses in different parts of State forest. The Special Protection Zone (SPZ) will be managed for conservation, and timber harvesting will be excluded. The Special Management Zone (SMZ) will be managed for specific features while catering for timber production under certain conditions. The General Management Zone (GMZ) will cater for a range of uses with timber production as a high priority.

A process for reviewing management strategies and zones enables progressive refinement of the Plan in response to new information and developments in natural resource management.

This Plan provides: a network of protected areas forming part of the National Forest Reserve System that complements the system of national parks and conservation reserves in the North East; a framework for sustainable use of the forest for timber production and other purposes; and a process for adapting to change in a systematic, and orderly manner. In doing so, this Plan will fulfil the major requirements of the NFPS. The Plan reflects the outcome of the North East Regional Forest Agreement.

SPECIFIC INITIATIVES

Conservation of Biodiversity

- In accordance with Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia (JANIS 1997), specified levels of reservation have been adopted for each of the Ecological Vegetation Classes (EVCs) occurring in the North East according to their rarity in the landscape. Where conservation reserves do not meet these targets, areas of State forest have been protected to make up the balance.
- The Plan addresses potential threats to flora and fauna populations, and identifies measures to mitigate such threats.
- As far as practicable, all rare and endangered EVCs (22 EVCs) on public land, 60% of the remaining extent of vulnerable EVCs (4 EVCs), and 15% of the pre-1750 extent of all other EVCs are protected.

- As far as practicable, all rare or depleted old-growth forest on public land is protected and where possible, sufficient State forest SPZ has been established to protect 60% of the area of all other old-growth forest types.
- In establishing and protecting large areas of mature forest, provision is made for recruitment of old-growth forest so that its total area will increase in the long term.
- A strategy for conserving rare and threatened plant species is established.
- Conservation guidelines have been established for key threatened and sensitive fauna species in State forest. These include measures to protect the Long-footed Potoroo, Spot-tailed Quoll, Brush-tailed Phascogale, Smoky Mouse, Spotted Tree Frog, Bandy Bandy, the Barking, Powerful, Sooty and Masked Owls and the Barred Galaxias in accordance with the management strategies for these species. Specific strategies are also established for a range of other forest fauna.
- A network of linear reserves generally of 200 m average width (or as otherwise specified by legislative requirements) has been designed to maintain resident populations of sensitive fauna such as arboreal mammals, forest bats and hollow-nesting birds across the landscape. These will also facilitate the re-colonisation of areas that are harvested for wood production or burnt by wildfire.
- A number of areas in the SMZ will be managed to retain high wildlife values while continuing to provide access to timber resources.

Forest Production

- The area of forest suitable and available for sustainable sawlog production accounts for approximately 12% of public land and contributes approximately 8% of Victoria's annual production of sawlogs.
- NRE has adopted a fully commercial approach to the management of its production forest, with strong support for value-adding of timber resources. Policies are in place to ensure resource security and provide for development and growth of a sustainable timber industry.
- The combined sustainable yield of sawlogs for the FMAs of the North East (Benalla–Mansfield, Wodonga and Wangaratta) is 66 500 m^3 of A, B, C and D grade sawlogs per year.
- Harvesting and regeneration systems are the key to sustainable forestry. A number of scientifically based harvesting and regeneration systems are used within the forests of the North East including clear felling, seed tree and selection harvesting.
- The forests of the North East will continue to supply a range of minor timber products including firewood, posts and poles, minor forest produce such as seed, honey, cut flowers, and speciality timbers such as Blackwood and Red Stringybark.

Forest Protection

- The forest management zones in this Plan have been reconciled as far as possible with zones for fuel-reduction burning in the Fire Protection Plans covering the FMAs.
- The Plan provides for the ongoing protection of water quality as well as regular consultation with water supply and catchment management authorities.
- Seven urban water-supply catchments known as Designated Catchments, covering approximately 17 000 ha of State forest, will be managed to maximise security of water quality and yield for those communities. A further 21 areas in State forest were identified as Special Water Supply Catchment Areas under the Catchment and Land Protection Act 1994 because of their significance as water supply catchments.
- Priorities are established for control of pest plants and animals in State forest to complement the efforts of private landowners and ensure an integrated approach across all public land.

Cultural Heritage and Landscape Values

- NRE has prepared draft management plans for Heritage River Areas and Natural Catchment Areas in accordance with the *Heritage Rivers Act* 1992 and recommendations of the Land Conservation Council. These areas have been included in the reserve system and will continue to be managed in accordance with the *Heritage Rivers Act* 1992.
- A system for protecting landscape values from the visual impact of timber harvesting is established. It aims to minimise the impact on areas seen from the scenic-drive network and key lookout points.
- A process is established to protect Aboriginal places of significance in State forest while maintaining confidentiality about their locations and to ensure regular consultation with Aboriginal communities.
- Significant historic places are incorporated in the zoning system to ensure that they are protected and appropriately managed.

Tourism and Recreation

- State forests of the North East are estimated to attract approximately 360 000 visitor days per year and support 85 licensed tour operators. The Plan establishes a process to maintain liaison with regional tourism organisations to assist coordination of NRE tourism services with those of other public land managers and the private sector.
- Special Protection Zones have been established around several major State forest recreation sites to maintain their aesthetic qualities.
- The Plan identifies the diverse use of State forest for recreation and guides the planning, management and delivery of recreation programs through the establishment of Recreation Management Zones.
- The Plan encourages visitor compliance with voluntary codes relating to recreational activities including horse riding, four wheel driving, mountain bike riding, trail bike riding, bush walking and camping.
- There are 33 huts in the State forest planning area. Huts will be retained where they have heritage value or provide emergency refuge. A number of huts have regional or state heritage values, six huts sites are considered to have historic significance at a regional level and four huts have been nominated for or listed on the register of the National Estate or the Victorian Heritage Register.
- A scenic-drive network (using the existing road system) will provide access to national parks as well as a focus for protection of landscape values, and recreation and interpretative facilities.

Other Forest Uses

- This Plan incorporates guidelines for management and planning of other State forest uses including mining, extractives, grazing, beekeeping, and defence force training. The guidelines are intended to allow responsible use of State forest whilst minimising any adverse impacts on other forest values, and in some instances to separate activities in time and space.

Research

- The Plan establishes guidelines for the assessment of research project proposals and includes a schedule of research sites in State forest. State forest management actions considered incompatible with the objectives of approved research projects may be excluded for the duration of the project.

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BACKGROUND

1.1 SCOPE AND AIM

The North East Forest Management Plan (Plan) area covers over 2.3 million hectares in north eastern Victoria. The boundaries of the Plan area include the Murray River to the east and north, the Hume Highway to the west and the Great Dividing Range to the south. This Plan includes the Benalla–Mansfield Forest Management Area (FMA), Wangaratta FMA, the majority of the Wodonga FMA and a part of Central FMA (see Map 1). The small part of Central FMA included in the planning area does not contain any State forest and is therefore not subject to this Plan. The North East planning area includes the City of Wodonga and part or all of the Towong, East Gippsland, Indigo, Alpine, Wangaratta, Delatite, Strathbogie, Murrindindi and Mitchell Shires. Public land comprises around 1 253 800 ha, or 54% of the area, and is covered mostly by native forest. This Plan applies to State forest which covers 30% (approximately 697 000 ha) of the planning area and 56% of public land. The *North East Comprehensive Regional Assessment* Report (VicRFASC 1998b) provides extensive background information.

The primary aim of forest management plans is to ensure that State forest is managed in an environmentally sensitive, sustainable and economically viable manner. Forest management plans also seek to ensure that planning is a continuing process, responsive to changing community expectations and expanding knowledge of the forest ecosystem.

To achieve the key aim, this Plan establishes strategies for integrating the use of State forest for wood production and other purposes with the conservation of natural, aesthetic and cultural values across the whole planning area. This Plan is to apply for ten years unless a substantial change of circumstances (such as a major wildfire) warrants a review before then. Flexible management strategies however, will enable progressive refinement of the Plan in response to new information.

This Plan introduces several new approaches to forest management for the North East. Where existing practices are to continue, they have been subject to careful scrutiny to ensure they contribute to current forest policy goals.

Management vision for forests of the North East

NRE aims to manage the forests of the North East for the benefit of all Victorians. The vision for sustainable management of the North East forests has the following characteristics:

- management will aim to ensure that all indigenous species and communities will survive and flourish across their natural range;
- use of State forest resources will be according to world-best practice. Standards will be maintained and improved by implementation and review of codes of practice, management guidelines, prescriptions, licensing and regulation of commercial activities on public land and by staff training;
- forest management will be sensitive to the cultural significance of the North East forests to the community;
- use of State forest will contribute to the economic development and employment opportunities of the regional community;
- sustainable use of the forest for recreation and tourism will be encouraged and facilitated; and
- forest management will be flexible and responsive to new information. Where necessary, change will be introduced in a pro-active but orderly fashion in order to maintain confidence and stability of forest-based industries and the local economy.

1.2 LEGISLATIVE AND POLICY FRAMEWORK

This Plan is a working plan prepared and to be put into operation by the Secretary of the Department of Natural Resources and Environment (NRE) pursuant to Section 22 of the *Forests Act* 1958. This plan replaces the North East Proposed Forest Management Plan (NRE 1999a) prepared and put into operation pursuant to the same Act in 1999.

The Plan has been developed to conform with all Victorian land and natural resources legislation including the *Forests Act* 1958, *National Parks Act* 1975, *Land Act* 1958, *Reference Areas Act* 1978, *Heritage Rivers Act* 1992, *Flora and Fauna Guarantee Act* 1988 and the *Catchment and Land Protection Act* 1994. Protection of species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 is also provided for in this Plan. The Plan fulfils a requirement of the *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a). This Plan also conforms with the land use decisions made in accordance with the *Land Conservation Act* 1970 (LCC 1973; LCC 1974a; LCC 1977; LCC 1984; LCC 1986; LCC 1991a; LCC 1991b).

This Plan also addresses the requirements of the *National Forest Policy Statement* (Commonwealth of Australia 1992a) to which Victoria is a signatory. Accordingly, it incorporates the findings of the *Study of Old-growth Forest in Victoria's North East* (NRE 1998e), the assessment of national estate values (VicRFASC 1999b), and the outcomes of the North East Regional Forest Agreement (VicRFASC 1999c).

Other legislation, policies and plans of relevance are referred to as necessary throughout the Plan.

The Victorian Environment Conservation Council (ECC) is currently reviewing public land use in the Box-Ironbark Study Area which includes public land in the North East in the vicinity of the Mt Pilot Multi-Purpose Park. Draft recommendations for the protection and management of Victoria's Box-Ironbark Forests and Woodlands (ECC 2000) were released for public comment in May 2000. Final recommendations are expected by the 30th June 2001. Following the completion of the study, NRE will manage the Box-Ironbark forests and woodlands according to the ECC recommendations as accepted by the Victorian Government.

This Plan establishes broad strategies for forest management. In addition to establishing a system of Forest Management Zones for State forest that identifies priorities and permitted uses for different parts of the forest, a series of management guidelines and actions have been developed.

Management Guidelines give direction to forest managers to facilitate protection or careful management of specific values or uses.

Management Actions commit NRE to implementing a number of actions, which will further enhance the management of State forest.

More detailed prescriptions are established at the local level and are reflected in Management Prescriptions and Wood Utilisation Plans. Appendix A is adapted from the *Code* and provides an outline of the relationship between the public land planning processes in the State and of the various levels of control of the environmental aspects of timber production.

1.3 MATTERS CONSIDERED DURING PLANNING

The major themes addressed by this Plan and other matters raised by the community are set out below.

Sawlog harvesting rates

The estimated rate at which sawlog harvesting can be maintained from each FMA in the State (the sustainable yield rate) is defined in Schedule 2 of the *Forests Act* 1958.

The timber resource analysis, conducted as part of the forest management planning process and the North East RFA, incorporated data from the Statewide Forest Resource Inventory (SFRI) for the North East (NRE 1997f). The timber resource analysis reflects the zoning scheme and relevant management strategies in this Plan. This process has ensured that the sustainable supply of sawlogs is coordinated with the environmental protection measures included in this Plan. The timber resource analysis indicates that the current level of sawlog supply can be maintained, subject to periodic review.

Biodiversity conservation

The forests of the North East consist of areas extending along the Great Dividing Range and associated foothills and patches of remnant forest existing amongst the now largely cleared hills, and plains. Extensive clearing of the lower foothills and plains for agricultural and urban uses has reduced the diversity of flora and fauna in the North East. A total of 58 Ecological Vegetation Classes (EVCs) have been identified as currently occurring in the North East. Each EVC represents one or more plant communities that occur in similar types of environment. Of the 58 EVCs occurring in the North East, 40 can be found on public land, 27 of which occur in State forest. About 152 flora species, 34 terrestrial fauna species and 8 aquatic fauna species are considered to be rare or threatened in State forests of the North East.

Approximately 34% of public land in the North East is included in conservation reserves. Appropriate management of flora and fauna and their communities in State forest, however, is an essential part of maintaining regional biodiversity. This Plan adopts a multi-tiered approach to biodiversity conservation. It analyses the representation of EVCs in existing conservation reserves and, where necessary, provides protection for additional areas in State forest. It addresses a series of processes that threaten flora and fauna populations, and identifies measures to mitigate these threats. Further, this Plan establishes a framework of protection for rare and threatened species, which require specific management actions to ensure their continued survival in the forests of the North East. Approximately 25% of State forest has been included in the Special Protection Zone (SPZ) and approximately 3% in the Special Management Zone (SMZ).

Water quality and yield

Most areas of State forest in the North East lie within catchments that provide water to surrounding cities and towns or provide water for irrigation purposes. Maintaining the quality and yield of water supplied from these catchments is an important aim of this Plan. Information gathered during the preparation of this Plan indicates that the quality of surface water from State forest is suitable for domestic use and, at the catchment scale, yield has not been affected by forest management activities. This Plan identifies seven urban water-supply catchments, covering approximately 21 000 ha of State forest, where measures will be taken to increase the security of water quality and yield.

Recreation and tourism

Recreation is an important use of the North East State forests. Their proximity to Melbourne, Albury and Wodonga and other large towns in north eastern Victoria mean that they are popular choices for urban residents seeking recreation opportunities in a forest environment. This Plan establishes targets for the provision of recreation facilities and opportunities based on current and likely future demand. It also protects opportunities for recreation in the more remote forest areas. Planning for recreation in State forests is coordinated with the facilities and opportunities available in parks and reserves in the North East.

Beechworth, Chiltern, Bright, Mansfield and the alpine region are all major tourist destinations that rely, at least in part, on recreation opportunities provided in State forests. This Plan recognises the role of forest recreation in the regional tourism industry and establishes a framework for communication and coordination with tourist industry associations.

Management of historic and cultural sites

There are only a few known sites to indicate physical evidence of Aboriginal occupation of the North East forests, but this Plan recognises the continuing special relationship between Aboriginal people and the land. It re-affirms NRE's commitment to protecting Aboriginal Places in accordance with the Victorian *Archaeological and Aboriginal Relics Preservation Act* 1972 and the Commonwealth's *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984.

Subsequent to European settlement, the forests within the North East have been used for many purposes. Gold mining and timber production have been the major uses and have provided relics and artefacts that are valuable for education and research, and for their cultural significance. Areas of the high country have long been associated with cattle grazing and many of the remaining huts are indicative of past and present use. Based on this information, this Plan establishes a framework for decisions about appropriate forms of protection for historic sites.

Upper Wongungarra Catchment/Mount Murray Forest Block

The North East Regional Forest Agreement (RFA) confirmed that an area of State forest in the upper Wongungarra catchment was to become part of the Alpine National Park. Following the Gippsland RFA and consistent with Government policy, the contiguous Wongungarra Remote and Natural Area was also added to the Alpine National Park. The *National Parks (Amendment) Act* 2000 provides for the addition of these areas to the Park.

Plantations

The North East has extensive softwood plantations and an increasing area of hardwood plantations. This Plan acknowledges that these plantations, in combination with native forests, will continue as a source of timber for both the hardwood and softwood timber industry.

1.4 LINKS WITH THE NORTH EAST REGIONAL FOREST AGREEMENT

In August 1999, the Prime Minister of Australia and the Premier of Victoria signed the North East RFA. The RFA established the framework for the future management of forests in the North East. Importantly, it satisfied the environmental protection and industry development requirements of both Governments, ensuring a durable basis for future planning and investment.

The RFA formally accredits the North East Forest Management Plan as part of Victoria's Ecologically Sustainable Forest Management system. The RFA also makes reference to several other issues associated with the Plan. These are summarised below.

CAR Reserve System

In the North East, the comprehensive, adequate and representative (CAR) reserve system on public land comprises areas established for conservation purposes (e.g. National and State Parks) and areas set aside for conservation within the Special Protection Zone (SPZ) in State forest. In signing the RFA, the Commonwealth and Victorian Governments have agreed that the CAR reserve system satisfies the National Reserve Criteria.

Sawlog Production

The North East RFA has identified the minimum current level of supply of D+ sawlogs per annum from the North East region (comprising the Benalla/Mansfield and Wangaratta FMAs and part of the Wodonga FMA) for the next twenty years. The RFA also recognises that timber supply levels in Victoria are subject to change based on periodic review of sustainable yield. This review is currently in preparation.

Residual Log Utilisation

The export of hardwood woodchips or unprocessed wood sourced from North East will not be subject to controls under the *Export Controls Act* 1982 while the RFA is in place.

Integrated Forest Planning System

Victoria has developed a system of linked computer-based tools collectively called the Integrated Forest Planning System (IFPS). The IFPS provides a means of modelling the growth, development and harvesting of forest stands as well as a range of other forest values.

The RFA commits Victoria to implementing IFPS in North East for the review of sustainable yield. This review is scheduled for completion in Benalla–Mansfield FMA by 30 June 2001 and the Wangaratta and Wodonga FMAs by 31 December 2001.

Management of Cultural Values

The RFA commits the Victorian and Commonwealth Governments to joint development of a package of measures that will be implemented by Victoria to ensure the appropriate management of Aboriginal heritage values in North East. These measures are the development of Statewide guidelines for the management of cultural heritage values, provision of participation and negotiation through the establishment of formal consultation mechanisms with local Aboriginal communities; modelling to establish priority areas for future surveys of Aboriginal sites; and training of staff.

National Estate

The RFA recognises that many of the national estate values are well reserved in the CAR reserve system and that this Plan and other mechanisms provide for the conservation of many other national estate values in the region. All national estate values in North East will be conserved through the application of the principles for managing national estate values as detailed in this Plan.

Management zone boundaries may require review in implementing this Plan. Best endeavours will be used by NRE to maintain the levels of protection of national estate values in a regional context, however, minor changes to the levels of protection of individual values may occur as a result of changes to the SPZ through time as new information becomes available.

Monitoring and Reporting

The RFA commits the Victorian and Commonwealth Governments to joint development of an appropriate set of indicators to monitor and review the sustainability of forest management practices. The Governments have agreed that any indicators established will be consistent with the criteria established under the Montreal Process, and will take into account the framework of regional indicators developed by the Montreal Process Implementation Group. These processes further advance the monitoring and reporting commitments in this plan.

1.5 PLANNING PROCESS

Work commenced on this Plan in late 1996 with the publication of a brochure, *The North East Forests: Planning Their Future*, which served to advise interested groups and individuals on development of this Plan and invited their contact with the planning team. The links between the planning processes for the management of State forest is shown in Appendix A. The North East RFA process commenced in 1997 and proceeded concurrently with the development of the Plan.

The planning team undertook a detailed review of current management issues and gathered a variety of information about the resources, uses and values of the North East. In addition, the *North East Victoria Comprehensive Regional Assessment* (VicRFASC 1998b) prepared to support the North East RFA, examined the natural, cultural, social, resource and economic values of the forests in the North East. The

extensive biological, social and cultural data presented in the *North East Victoria Comprehensive Regional Assessment* provides much of the background information upon which this Plans management strategies are based.

This Plan was developed in consultation with experts in disciplines such as forestry, botany, wildlife biology, catchment management, water resources, cultural heritage and recreation planning.

A Forest Management Plan Advisory Committee, comprising members of the community living within the North East planning area, was appointed early in the planning process to ensure that public involvement was effective and that NRE was able to gauge community attitudes to the various forest planning options and decisions. Committee members exhibited extensive community networks resulting from their involvement in community groups or their professions. They represented a broad range of viewpoints on forest management and several had specialist environmental planning skills.

The Committee met regularly throughout the development of the Plan to discuss planning issues and to review management proposals. It has sought to ensure that the interests and opinions of a wide cross-section of the community have been properly considered by NRE in preparation of this Plan. Appendix B documents the meetings and workshops held in association with the development of this Plan and the RFA process.

This Plan was released as a Proposed Plan for public comment in April 1999 (in parallel with the North East RFA Directions Report). Forty-six submissions were received from individuals and organisations, the names of which are listed in Appendix Z. These submissions were considered during the preparation of the final Plan.

Final Plan

The following is a summary of the main changes made to produce this, the final plan. The changes are a result of public consultation, new information, additional input from NRE staff and the outcomes of the North East RFA (VicRFASC 1999c).

Zoning

The areas of management zones (shown in table 2.1) have changed from the proposed plan. The principal reasons for the changes to the zoning are listed below.

- The Upper Wongungarra catchment, previously SPZ, has been added to the Alpine National Park for its environmental values including old-growth forest, remote and natural attributes, and Spotted Tree Frog habitat.
- The Wongungarra Remote and Natural Area has been added to the Alpine National Park.
- The protection measures for the Long-footed Potoroo now incorporate a consolidated habitat area approach based on the Humffray River and Riley Creek catchments. The area supports the greatest density of confirmed records and has been added to the SMZ.

Biodiversity Conservation

- Some of the conservation guidelines or prescriptions have been modified to assist in understanding, or to provide greater consistency with other Forest Management Plans.
- The Long-footed Potoroo Conservation Guideline is now based on the establishment of a consolidated area of habitat in addition to a number of non-contiguous SMZ areas.
- The Spotted Tree Frog Conservation Guideline has been modified to reflect the draft Action Statement in regard to roading within the SMZ, the preparation of a strategic roading plan, and additional prescriptions for mineral exploration and mining activities that may affect habitat.
- The list of threatened flora in Appendix K has been updated to include all current flora records within State forest, new records, and recent changes to the threat status of some species under the FFG Act.

Forest Production

- The next review of sustainable yield levels based on resource information from the SFRI and the use of the IFPS have been scheduled for each FMA, consistent with the North East RFA. This review is scheduled for completion in Benalla–Mansfield FMA by 30 June 2001 and the Wangaratta and Wodonga FMAs by 31 December 2001.

Tourism and Recreation

- A deer hunting section has been included in recognition of the significance of this recreation activity in State forest.
- A licensed tour activities guideline has been included.
- A section on the Australian Alps Walking Track has been added to clarify the management of the State forest portion of the track and its associated landscape values.

Cultural Values, Native Title and Landscape

- A section specifically addressing native title has been added to clarify that all proposals on State forest must be considered in light of the future act provisions of the *Native Title Act* 1993.
- The cultural heritage section refers to the North East RFA commitment to develop a package of measures to ensure the appropriate management of Aboriginal heritage.
- A management guideline for the Mt Wills Historic Area supplements the existing landscape guideline.

Other Forest Uses

- A section on prospecting and fossicking is included in recognition of the widespread nature of this activity in the North East.

Implementation

- The process for reviewing guidelines, prescriptions and the zoning scheme has been updated to reflect the requirement of the North East RFA.

Chapter 2
FOREST MANAGEMENT ZONES

2.1 ZONING SCHEME

A principal strategy to achieve the aims of the North East Forest Management Plan (Plan) was to divide State forest into three management zones (see Table 2.1 and Map 2).

- **Special Protection Zone** (SPZ) will be managed for conservation and timber harvesting will be excluded. It forms a network designed to link and complement conservation reserves.
- **Special Management Zone** (SMZ) will be managed to conserve specific features, while catering for timber production and other utilisation activities under certain conditions.
- **General Management Zone** (GMZ) will be managed for a range of uses and values, with timber production a major use.

Developing the zoning scheme

Many of the management strategies developed in this Plan are expressed through zoning decisions which either set aside areas from timber harvesting or which permit harvesting or other activities to continue under specified conditions.

The zoning system consolidates and integrates information and management requirements from many sources. In developing the zoning system, one of NRE's aims is to establish a Comprehensive, Adequate and Representative (CAR) forest reserve system in accordance with nationally-agreed criteria, while limiting resource withdrawals as far as possible to minimise economic disruption in the region.

The CAR Reserve System comprises reserves including National Parks, State Parks, Flora and Fauna Reserves, Reference Areas, Remote and Natural Areas, Heritage River Areas and Natural Catchment Areas and also areas of SPZ in State forest.

The principle elements of the zoning system are summarised below.

Code of Forest Practices for Timber Production (the Code) **(NRE 1996a)**

The *Code* requires the exclusion of timber harvesting from a minimum 20 m buffer on permanent streams and a general exclusion of timber harvesting from slopes greater than 30º. Decisions on the application of these measures are made during the development of coupe plans. During development of this Plan, modelling was carried out to predict the implication of applying these measures.

Flora and Fauna Guarantee Act Action Statements

Action Statements specify the management requirements for species, communities or potentially threatening processes which are listed in schedules of the *Flora and Fauna Guarantee Act* 1988 (FFG Act). Action Statements are developed by multi-disciplinary teams, which consider both ecological and economic issues relevant to the subject of the statement. Several Action Statements are in draft form, enabling close coordination with the development of the Plan. Some Action Statements establish management strategies that translate into forest zoning decisions. In these cases, the Plan is the primary instrument for implementing Action Statements in State forest.

Forest Owl conservation

Forest owls breed in hollow trees and hunt over large areas of mature forest. Implementing management strategies developed for Sooty, Powerful and Masked Owls required establishment of extensive areas of State forest SPZ to complement habitat occurring in parks and reserves.

Other threatened flora and fauna

Management guidelines for a number of flora and fauna species considered rare or threatened and which do not have Action Statements have been developed in consultation with experts and incorporated into the zoning scheme. SPZs and SMZs have been established for the conservation of these species where they are known to occur in State forest.

Ecological Vegetation Class protection

SPZs have been established to contribute to conservation targets for Ecological Vegetation Classes (EVCs) in accordance with the national reserve criteria. As far as practicable, all areas of rare and endangered EVCs in State forest have been included in SPZs. Sufficient State forest SPZ has been established to ensure at least 15% of the pre-1750 extent of other EVCs are protected in either conservation reserves or State forest SPZ.

Old-growth protection

SPZs have been established to contribute to conservation targets for old-growth forest in accordance with the national reserve criteria. As far as practicable, all areas of rare old-growth in State forest have been included in SPZ. Where possible, sufficient State forest SPZ has been established to ensure at least 60% of the area of common old-growth EVCs is protected.

Sites of Significance

A small number of Forest Blocks within the North East were subject to ecological surveys and results were published in Ecological Survey Reports (CFL 1987a; CFL 1987b; CFL 1988; DCE 1992). Several of these Forest Blocks are now within the Alpine National Park. Where Sites of Significance have been identified in State forest, this Plan reviewed the values and location of the sites for inclusion into the SPZ (see Appendix J).

Landscape

A number of areas considered to have high sensitivity to landscape disturbance have been included in the SMZ. These areas will be managed to minimise the medium to long term visual impact of management activities.

Recreation sites

SPZ buffers have been established around several major State forest recreation sites to maintain their aesthetic qualities.

Designated catchments

A number of small catchments used for domestic water supply and that may be particularly sensitive to the impacts of timber harvesting and road construction have been included in the SMZ.

Zoning for each of the above values is developed separately. However, at every stage NRE seeks to integrate zoning decisions with the aim of ensuring the zoning system maximises conservation values in the special protection zone while at the same time minimising impacts on forest industries. An important step to finalise the zoning system was the rationalisation of boundaries to ensure that, as far as possible, the boundaries of zones are clearly identifiable in the field.

Table 2.2 indicates the activities permitted in each zone. Soil and water conservation, maintenance of native forest cover and wildfire suppression are high priorities in all zones.

Table 2.1 Extent of forest management zones and other land categories in the North East Forest Management Plan Area

	Area (ha)	Proportion of all land (%)	Proportion of public land (%)	Proportion of State forest (%)
STATE FOREST				
Special Protection Zone	171 035	7.4	13.6	24.5
Special Management Zone	22 072	1.0	1.8	3.2
General Management Zone				
Productive area[1]	150 070	6.5	12.0	21.5
Other uses[2]	238 120	10.3	19.0	34.2
Code exclusions[3]	115 664	5.0	9.2	16.6
State forest sub-total	**696 961**	**30.1**	**55.6**	**100**
OTHER PUBLIC LAND				
Conservation reserves[4]	428 110	18.5	34.2	
Softwood plantations[5]	56 550	2.4	4.5	
Other public land[6]	72 145	3.1	5.8	
Other public land sub-total	**556 805**	**24.0**	**44.4**	
Public land sub-total	**1 253 766**	**54.1**	**100**	
PRIVATE LAND				
Private land sub-total	**1 064 378**	**45.9**		
Total area for the North East	**2 318 145**	**100**		

Notes:

1. This is the estimated net productive area of forest, as defined by the State Forest Resource Inventory (SFRI), available for sawlog production in the GMZ. This value does not take into account limitations on accessibility or the economic feasibility of harvesting small or remote areas of productive forest.
2. Areas unproductive for sawlog and suitable only for the production of firewood and other minor or non-timber produce are included in the 'Other uses' category.
3. Streamside reserves and steep slopes (greater than 30^0) protected by *Code* prescriptions within the GMZ and SMZ are included in *Code* exclusions.
4. Although not subject to this Plan, these areas, which include parks, were taken into account in formulating management strategies for State forest.
5. Almost all public land softwood plantations are lands subject to long term leases to Hancock Victorian Plantations.
6. Other public land includes the Alpine Resorts (Falls Creek, Mount Hotham, and Mount Stirling), Kiewa Hydro-electricity Scheme and land managed by water supply authorities, and other parcels of public land that cannot be classified as either State forest or conservation reserve.

Combined with parks and other conservation reserves, the forest management zones provide an integrated conservation system and a framework for sustainable forest use. The inset in Map 2 illustrates elements of the zoning system in detail. Map 2 illustrates the zoning scheme across the North East planning area, while Appendix C lists the attributes of each component of the SPZ and SMZ (each defined by a specific code and identified on Map 2).

2.2 SPECIAL PROTECTION ZONE (SPZ)

Most of this zone has been generated by applying the conservation guidelines described above and reserve design principles. Larger components of the zone are based on:

- representative examples of vegetation communities;
- representative examples of old-growth; and
- localities of key threatened and sensitive fauna.

These are linked to each other and to conservation reserves by other parts of the SPZ including linear reserves.

A number of smaller areas identified as sites of biological significance and some research sites are also included in the SPZ. Some sites containing important features that require special management are small and are represented as point locations on Map 2.

Each component of this zone will be managed to minimise disturbances or processes that threaten their respective values, and timber harvesting will be excluded.

2.3 SPECIAL MANAGEMENT ZONE (SMZ)

The areas included in this zone cover a range of natural or cultural values. The protection or enhancement of these values require modification to timber harvesting or other land-use practices rather than their exclusion. The zone contributes substantially to the conservation of important species, particularly fauna.

The majority of the zone is derived from three strategies.

1. The quality or yield of water from domestic water-supply catchments may be sensitive to forest management operations where State forest comprises a substantial proportion of the total catchment area. These 'designated catchments' are included in the SMZ, and special guidelines for the conduct of timber-harvesting operations are applied (in addition to those set down under the *Code*) (see Section 5.3).
2. A large consolidated Long-footed Potoroo Special Management Area (SMA) has been established, along with a number of non-contiguous SMAs and these are included in the SMZ. However, harvesting operations are currently excluded from these SMAs until research regarding Long-footed Potoroo response to disturbance is completed. Where the SMAs coincide with other biodiversity values, they may be included in the SPZ.
3. Landscapes with high visual sensitivity are included in the SMZ, and guidelines for the conduct of timber harvesting operations are applied (in addition to those set down under the *Code*).

Management of the SMZ will be considered on a case-by-case basis, drawing on expertise of relevant personnel within NRE, and keeping within the constraints outlined in this Plan. However, development of operational detail by way of SMZ Plans will be undertaken during implementation of this Plan.

Timber and other forest produce may be harvested from this zone. As with the GMZ, this zone forms part of the area that contributes to the sustainable yield of sawlogs, provided that modifications to normal management practices adequately address the protection of the identified values, or positively contribute to their conservation.

2.4 GENERAL MANAGEMENT ZONE (GMZ)

Forest in this zone will be managed for the sustainable production of timber and other forest products in accordance with the *Code* and more detailed local management prescriptions. Associated aims include protection of landscape, provision of recreation and educational opportunities, fire protection and conservation of natural values to complement adjacent zones. Together with the SMZ, this zone provides the net area available for timber production. The zone has three sub-zones; timber production, other uses and *Code* exclusions.

Timber production sub-zone

This sub-zone will be used to produce sawlogs on a sustainable basis in accordance with the *Code* and regional prescriptions. It corresponds to the net area in both the GMZ and the SMZ that is both available and suitable for producing sawlogs after exclusions have been made for factors such as steep slopes and low productivity. It generally corresponds to sites where soil and rainfall conditions enable suitable tree species to grow to a height of about 28 m or greater. Harvested areas will be regenerated with local species, and the regrowth across the sub-zone will produce a mosaic of native forest of different ages.

Other uses sub-zone

A substantial proportion of the forest within the GMZ and the SMZ is unsuitable for sawlog production because productivity is too low for sawlog harvesting under current arrangements. Nevertheless, this sub-zone contributes substantially to the conservation of drier forest types and their associated fauna. Activities such as fuel-reduction burning, harvesting of other forest produce (such as firewood, poles and honey) and recreation are permitted. The extent of the other uses sub-zone is derived from SFRI forest mapping and is not shown on Map 2.

Code exclusions sub-zone

This sub-zone identifies the areas within the GMZ and SMZ that are excluded from harvesting operations due to the requirements of the *Code*. It includes stream buffers and slopes generally greater than 30^0. Much of this area will remain largely undisturbed and contributes to the conservation of a number of EVCs and related fauna. The areas shown on the inset on Map 2 represent a modelled prediction of the location of steep slopes and streamside buffers. The actual location of these buffers will be based on field inspections conducted during the development of timber harvesting coupe plans.

Table 2.2 Activities in forest management zones

Activity	Chapter	SPZ	SMZ	GMZ
Sawlog and residual log production	4	No	Cond.	Yes
Firewood, posts, poles	4	No	Cond.	Yes
Regrowth thinning	4	No	Cond.	Yes
Fuel-reduction burning	6	Cond.	Cond.	Yes
Recreation[1]	7	Cond.	Cond.	Yes
Apiculture	9	Cond.	Cond.	Yes
Seed collection	9	Cond.	Cond	Yes
Stock grazing	9	Cond.	Cond.	Yes
Extractive activities	9	Cond.	Cond.	Yes
Mining activities	9	Yes	Yes	Yes
Road construction	10	Cond.	Cond.	Yes

Note: This table provides a guide to the issue of consent for various activities in State forest zones. Further details are provided in relevant chapters.

1. Recreational activities may include bushwalking, fishing, hunting, four-wheel driving, horse riding and camping.

Key:

Yes Permitted under standard conditions.

Cond. Permitted with additional conditions specified in this Plan, or to the extent it does not conflict with the values identified for the respective areas.

No Not permitted.

Chapter 3
BIODIVERSITY CONSERVATION

Biodiversity (or biological diversity) refers to the variety and variability among living organisms and the ecological processes upon which they depend. The National Forest Policy Statement (NFPS) (Commonwealth of Australia 1992a) and the National Strategy for Ecologically Sustainable Development (Commonwealth of Australia 1992b) refer to the importance of maintaining forest biodiversity. Victoria's *Flora and Fauna Guarantee Act* 1988 (FFG Act) and the *Biodiversity Strategy* (NRE 1997i) further support processes that ensure all taxa of Victoria's flora and fauna can survive, flourish and retain their potential for evolutionary development in the wild.

Aim

To ensure all indigenous flora and fauna survive and flourish throughout the planning area.

The North East planning area

Prior to European settlement, vegetation of the North East area comprised subalpine woodlands, heathlands and grasslands, tall open forests in higher rainfall areas, open forests and woodlands on the drier hills, open grassy forest in valleys and grassy woodlands on the alluvial plains. The sub-alpine habitats and open forests remain largely intact, however the open grassy forests and grassy woodlands have been largely cleared or modified for agricultural and urban uses. The remaining vegetation of rare and depleted vegetation types on public land has important conservation significance.

Approximately 2 000 species of vascular plants and 453 species of vertebrate animals have been recorded in the North East. As part of the North East Regional Forest Agreement (RFA) process, analyses of previous flora and fauna surveys were conducted. From these analyses, gaps were identified and further fauna survey work was undertaken. Over 200 sites were surveyed and the results have provided considerable information on fauna of the North East. In addition to the existing flora information, a further 348 sites were surveyed for flora during the Ecological Vegetation Class (EVC) mapping project and added significantly to the existing data (VicRFASC 1998b).

While the strategies in the North East Forest Management Plan (Plan) apply only to State forest, they are framed in the context of all native forest on public land being part of a permanent estate that contributes significantly to biodiversity conservation. They are also designed to build on and complement the protection provided by the system of dedicated conservation reserves established following Land Conservation Council (LCC) studies into public land use (LCC 1973; LCC 1974a; LCC 1977; LCC 1979; LCC 1983; LCC 1986), wilderness (LCC 1991b) and rivers and streams (LCC 1991a). Within the study area, conservation reserves total approximately 428 000 ha or 34% of public land. State forest occupies approximately 697 000 ha or approximately 56% of public land. The remaining public land includes alpine resorts, plantations, water bodies and other public land. (See Chapter 2 – Forest Management Zones).

The strategies in this Plan address biodiversity conservation through:

- protection of a significant proportion of all forest ecosystems in dedicated conservation reserves or the State forest Special Protection Zone (SPZ);
- specific conservation measures for threatened or sensitive flora and fauna; and
- control of processes that may threaten biodiversity.

3.1 ECOSYSTEM DIVERSITY

Classification of ecosystems

An ecosystem is a community formed by living organisms together with their environment. For the purposes of this Plan, EVCs described in the North East Comprehensive Regional Assessment (CRA) (VicRFASC 1998a) are considered ecosystems. An EVC comprises one or more floristic communities with defined floristic, structural, biophysical and ecological characteristics. In the North East 58 EVCs, (including 29 vegetation mosaics or complexes), have been identified. Of these, 31 occur predominantly on private land and 27 occur predominantly on public land. The considerable variation within some EVCs is recognised and catered for by the strategies described below.

Indicative maps of the original (pre 1750) extent of EVCs on land that is now cleared have also been compiled (VicRFASC 1998b). These were prepared by extrapolating from EVC maps of existing vegetation with reference to land system information, and through extensive field inspections of remnant vegetation and aerial photograph interpretation.

Descriptions of EVCs occurring on public land in the North East are included in Appendix E.

Classification of old-growth

Old-growth forest in the planning area has been identified by documenting and analysing forest characteristics and disturbance records (NRE 1998e; VicRFASC 1998b). Old-growth forest is defined as:

> '...forest which contains significant amounts of its oldest growth stage in the upper stratum—usually senescing trees—and has been subject to any disturbance, the effect of which is now negligible.' (Woodgate et al. 1994)

The Study of Old-growth Forest in Victoria's North East (NRE 1998e) identified 14 EVCs containing 261 210 ha of old-growth forest which covers public land. A further 21% of public land was identified as supporting 'negligibly disturbed forest' that has not yet reached its oldest growth stage, and another 11% as supporting forest significantly disturbed by natural means, that is regrowth forest originating from wildfire. The remaining 47% of public land was considered significantly disturbed by unnatural or unknown means and unable to qualify as old-growth forest until the effects of past disturbances diminish.

EVCs containing old-growth forest are listed in Appendix F.

3.2 NATIONAL RESERVE CRITERIA

The National Forest Policy Statement (Commonwealth of Australia 1992a) includes a requirement to establish a Comprehensive, Adequate and Representative (CAR) reserve system as a prerequisite to the signing of a RFA. Accordingly, the Commonwealth and states jointly developed a set of criteria (the JANIS[1] criteria) to guide the establishment of a CAR forest reserve system in each RFA region.

Summary of National Reserve Criteria

Biodiversity criteria

- As a general criterion, 15% of the pre-1750 distribution of each forest ecosystem should be protected in the CAR reserve system with flexibility considerations applied according to regional circumstances, and recognising that as far as possible and practicable, the proportion of dedicated reserves should be maximised.
- Where forest ecosystems are recognised as vulnerable, (e.g. approaching a reduction in areal extent of 70% within a bio-regional context and which remains subject to continuing threatening processes, or not

1 *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia.* A report by the Joint Australian and New Zealand Environment and Conservation Council/Ministerial Council on Forestry, Fisheries and Aquaculture National Forest Policy Statement Implementation Sub-committee. September 1996.

depleted but subject to continuing and significant threatening processes which may reduce its extent), then at least 60% of their remaining extent should be reserved. These ecosystems include those where threatening processes have caused significant changes in species composition, loss or significant decline in species that play a major role within the ecosystem, or significant alteration to ecosystem processes.

- All remaining occurrences of rare and endangered forest ecosystems should be reserved or protected by other means as far as is practicable.
- Reserved areas should be replicated across the geographic range of the forest ecosystem to decrease the likelihood that chance events such as wildfire or disease will cause the forest ecosystem to decline.
- The reserve system should seek to maximise the area of high quality habitat for all known elements of biodiversity wherever practicable, but with particular reference to:
  - the special needs of rare, vulnerable or endangered species;
  - special groups of organisms, for example species with complex habitat requirements, or migratory or mobile species;
  - areas of high species diversity, natural refugia for flora and fauna and centres of endemism; and
  - those species whose distributions and habitat requirements are not well correlated with any particular forest ecosystem.
- Reserves should be large enough to sustain the viability, quality and integrity of populations.
- To ensure representativeness, the reserve system should, as far as possible, sample the full range of biological variation within each forest ecosystem, by sampling the range of environmental variation typical of its geographic range and sampling its range of successional stages.
- In fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system. The areas should be identified and protected as part of the development of integrated regional conservation strategies.

Old-growth forest criteria

- Where old-growth forest is rare or depleted (generally less than 10% of the extant distribution) within a forest ecosystem, all viable examples should be protected, wherever possible. For other forest ecosystems, a minimum of 60% of the old-growth forest identified at the time of assessment should be protected. Where disturbance and fragmentation are less evident, lower thresholds may apply.

The National Reserve Criteria also provide for the flexibility in the application of numerical targets where there may be significant economic or social consequences in fully meeting targets. Table 3.1 lists all EVCs occurring on public land and the National Reserve Criteria Targets associated with each.

Table 3.1 National Reserve Criteria Targets for Ecological Vegetation Classes occurring on public land in the North East

Rare and Endangered **All remaining occurrences should be protected as far as is practicable**	**Vulnerable** **60% of remaining extent should be protected**
7. Clay Heathland	20. Heathy Dry Forest
18. Riparian Forest	47. Valley Grassy Forest
19. Riparian Shrubland	61. Box Ironbark Forest
48. Heathy Woodland	83. Swampy Riparian Woodland
55. Plains Grassy Woodland	
56. Floodplain Riparian Woodland	
67. Alluvial Terraces Herb-rich Woodland	
68. Creekline Grassy Woodland	
73. Rocky Outcrop Shrubland/Herbland Mosaic	
80. Spring Soak Herbland	
82. Riverine Escarpment Scrub	**15% of the pre-1750 distribution should be protected**
84. Riparian Mosaic – North East	
127. Valley Heathy Forest	21. Shrubby Dry Forest
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex	22. Grassy Dry Forest
	23. Herb-rich Foothill Forest
174. Grassy Dry Forest/Rocky Outcrop Shrubland/Herbland Mosaic	29. Damp Forest
	30. Wet Forest
175. Grassy Woodland	36. Montane Dry Woodland
185. Perched Boggy Shrubland	38. Montane Damp Forest
186. Plains Grassy Woodland/Floodplain Riparian Woodland Complex	41. Montane Riparian Thicket
	43. Sub-alpine Woodland
237. Riparian Forest/Swampy Riparian Woodland Mosaic	44. Treeless Sub-alpine Mosaic
	72. Granitic Hills Woodland
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic	79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic	153. Montane Damp Forest/Montane Wet Forest Mosaic
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic	244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic

Note: National Reserve Criteria relating to the status of each EVC are shown in Table 9.3 of North East Victoria CRA, Biodiversity Assessment Report (VicRFASC 1998a).

Table 3.2 lists all old-growth EVCs occurring on public land and the National Reserve Criteria targets associated with each.

Geographic Representation Units

Conservation of species and communities across their natural range is fundamental to sound nature conservation. Protecting multiple populations across a species' range conserves local diversity and genetic variation, and guards against the risk of species extinction as a result of isolated populations being destroyed by natural disasters or other factors. It is therefore important that the reserve system include viable examples of ecosystems at different locations across their natural geographic range and that the full range of variation within the ecosystem is sampled.

The planning area has been divided into 19 Geographic Representation Units (GRUs) with an average size of approximately 127 700 ha. GRUs are based on similar landform, geology, vegetation and climate. Ecosystem conservation has been considered at both a regional scale and within each GRU. Wherever possible, viable samples of the ecosystems present are reserved within each GRU. The GRUs are described in Appendix D and illustrated by Map 3.

Table 3.2 National Reserve Criteria Targets for old-growth occurring on public land in the North East

Ecological Vegetation Class	Target
18. Riparian Forest	all
20. Heathy Dry Forest	60%
21. Shrubby Dry Forest	60%
22. Grassy Dry Forest	60%
23. Herb-rich Foothill Forest	60%
29. Damp Forest	60%
30. Wet Forest	60%
36. Montane Dry Woodland	60%
38. Montane Damp Forest	60%
41. Montane Riparian Thicket	60%
43. Sub-alpine Woodland	60%
47. Valley Grassy Forest	all
72. Granitic Hills Woodland	60%
83. Swampy Riparian Woodland	60%
84. Riparian Mosaic – North East	all

Notes:

all – All remaining occurrences should be protected as far as is practicable.

60% – 60% of old-growth forest identified at the time of assessment should be protected.

3.3 REPRESENTATIVE CONSERVATION STRATEGY

Public land categories such as national parks, State parks, flora and fauna reserves and reference areas, which are reserved primarily for nature conservation form part of the CAR reserve system (Appendix G lists the relevant public land categories). The State forest SPZs identified in this Plan also form part of the CAR reserve system. The following management guidelines aim to ensure that the combined system of dedicated reserves and SPZ includes viable examples of all ecosystems in the planning area.

Appendix H shows the area and proportion of each EVC in each public land category across the North East. Appendix I indicates the proportion of each EVC protected in conservation reserves and the SPZ across all GRUs. Map 2 illustrates public land categories across the North East and the Forest Management Zones within State forest. The area of conservation reserves, together with the SPZ and areas excluded from timber harvesting by the *Code* total approximately 714 800 ha or 57% of public land within the North East.

Conservation Guideline
Ecosystem diversity

The proportion of EVCs and old-growth forest included in protected areas (conservation reserves and State forest SPZ) will be in accordance with the National Reserve Criteria. The targets for protection of EVCs and old-growth forest are shown in Table 3.1 and Table 3.2 respectively.

Base the selection of areas for inclusion in the SPZ on:

- analysis of ecosystem and old-growth forest representation in each (GRU);
- ensuring representation of known floristic and biophysical variation within EVCs and old-growth forest;
- maintaining representative and viable examples of ecosystems across their natural geographic range;
- protection of mosaics of old-growth forest, negligibly disturbed forest and naturally disturbed forest to provide for recruitment of old-growth forest in the long term;
- selecting areas that support the requirements of other conservation strategies in this Plan (e.g. for rare and threatened species);
- the creation of larger, consolidated areas in the SPZ defined by natural boundaries such as streams or ridgelines, or management boundaries such as roads;
- identifying areas that are not disturbed or fragmented (except where these are the only remaining examples of the community);
- identifying areas that help to establish an inter-linked protected area network across the planning area; and
- areas that, where feasible, are unsuitable for timber production.

3.4 MANAGEMENT OF PROCESSES AFFECTING THE STRUCTURE AND DISTRIBUTION OF ECOSYSTEMS

Many processes operating in forests, both natural and human-induced, have the potential to affect the distribution and structure of ecosystems and flora and fauna species. Several of these potentially threatening processes, relevant to forest management, are listed in Schedule 3 of the FFG Act.

Management of potentially threatening processes plays a key role in maintaining biodiversity by assisting protection of the integrity of reserved ecosystems and reducing the direct threat to flora and fauna populations. This section addresses the main processes in forests, which threaten ecosystems or flora and fauna populations of the North East.

Loss of hollow-bearing trees from Victorian native forests (listed under the FFG Act)

Although trees of all growth stages may be utilised by wildlife, live, hollow-bearing eucalypts are especially important as nesting and roosting sites for birds and arboreal mammals. Dead trees, whether standing (stags) or fallen, are also valuable habitat, providing hollows, denning sites, basking sites and foraging substrates for a range of wildlife species.

Tree hollows tend to occur in mature, senescent and dead trees. For the majority of eucalypts in the North East, hollows suitable for nesting and roosting begin to form in trees over 100 years old. Some State forest areas of the North East have been utilised for timber harvesting for over 100 years and the remaining hollow-bearing trees are fewer than would be found in undisturbed forest. For this reason, the larger trees should generally be favoured for retention as habitat trees.

Timber harvesting and timber stand management operations, fire and road construction or maintenance can remove or damage trees with hollows, and leave insufficient younger trees to replace losses and ensure continuing supply. In some instances, limited tree damage may promote hollow development but excessive damage may lead to tree death. However, the establishment of conservation reserves identified through the LCC process, and SPZ identified in forest management planning processes, will allow extensive areas of regrowth forest to age sufficiently so that they approach the level of hollow abundance found in mature undisturbed forest.

The loss of hollow-bearing trees in Victorian native forests is listed as a potentially threatening process under schedule 3 of the *Flora and Fauna Guarantee Act* 1988, and an Action Statement is in preparation. The *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a) specifies the need to retain habitat trees, with preference given to those located in situations most easily protected from damage during harvesting and subsequent management.

The current habitat tree prescriptions are detailed within the management prescriptions for timber harvesting and regeneration, however, they are currently subject to a statewide review by an NRE multi-disciplinary working group. The working group will develop objectives and principles for wildlife habitat retention in areas of State forest available for timber production. It will also establish processes for the development of habitat retention prescriptions which take into account harvesting methods, the requirements of key sensitive species and the extent of harvesting within forest landscapes. The outcomes of this process will guide the development of habitat tree prescriptions appropriate to the forests of the North East for the protection of hollow-bearing trees and other important habitat elements in areas used for timber production.

ACTIONS

Develop and implement revised habitat tree prescriptions for State forest in the North East within 2 years of the release of this Plan. The prescriptions should be consistent with the outcomes of the current review and will consider:

- ***the density of trees or habitat patches that should be retained in the GMZ, with regard to the proportion of forest reserved as conservation reserves, SPZ or Special Management Zone (SMZ);***
- ***the need for recruitment of habitat trees of varying age, species and form characteristics;***
- ***the retention of dead standing trees;***
- ***the location and distribution of habitat trees within logging areas;***
- ***the requirements and sensitivity of hollow-using wildlife populations to the loss of hollow bearing trees;***
- ***understorey species protection; and***
- ***the particular need to protect large hollow-bearing trees.***

Train supervising forest staff in the application of habitat tree prescriptions.

Monitor harvested areas to assess the implementation of prescriptions.

Habitat fragmentation as a threatening process for fauna in Victoria (nominated for listing under the FFG Act)

Forests provide a range of habitat resources, particularly for arboreal fauna. Fragmentation of optimal habitats through clearing, burning and timber harvesting contributes to a decline in certain sensitive forest species. Management of timber harvesting activities will ensure that mature forest existing in conservation reserves, SPZs and areas unavailable or unsuitable for harvesting are not isolated. In addition, off-reserve habitat management within the GMZ through habitat tree retention, retained forested areas and the use of understorey islands, will also contribute to maintenance of forest species and habitats. Understorey islands are described in *Understorey Islands: a method of protecting understorey flora during clearfelling operations* (NRE 1998f). Further research into the use of understorey islands is continuing. In addition operational guidelines to assist in identifying and managing understorey islands are currently in preparation.

Linking habitat areas with a network of suitable mature forest corridors is important for conservation of flora and fauna as it facilitates the:

- maintenance of resident populations of species across the region;
- provision of alternative refuge from broad-scale disturbances (e.g. wildfire) and subsequent species dispersal;
- provision of some of the habitat requirements of wide-ranging species (such as forest owls); and
- maintenance of gene-flow.

A network of linear reserves has been developed according to the guidelines below, and incorporated into the SPZ for State forests in the North East (see Map 2).

Management Guideline
Establishment of linear reserves

Linear reserves should:

- provide alternative links between conservation reserves and larger parts of the SPZ and SMZ;
- be sufficiently wide to maintain resident populations of large arboreal mammals—in general, 200 m average width (usually an approximate 100 m buffer on both sides of a stream), or as otherwise specified by legislative requirements;
- comprise mature forest, wherever possible;
- take into account the existing links provided through *Code* exclusions from timber production and non-productive forest; and
- build on and complement parks and reserves, Heritage River corridor areas and stream buffers retained in accordance with the *Code*.

Fire

The structure and floristic composition of many vegetation communities is strongly influenced by local fire regimes. During the past 150 years, the timing, frequency and intensity of forest fires have altered. In some areas, frequency has been reduced as a consequence of active suppression of naturally occurring fires. In other areas, fire frequency has increased as a result of fuel-reduction burning initiated to protect settlements and forest resources from wildfire. Fire protection measures for wildfire and the use of fuel reduction burning are described in *Chapter 6*.

Shrub layers and ground habitat such as litter and logs can be depleted through repeated burning. Regular burning can also promote weed invasion, which may reduce ecosystem diversity. Prescribed burning practices need to take into account the fire responses of different ecosystems, natural patterns of succession and the role of fire in the maintenance of biodiversity.

A major continuing research program conducted by NRE in the Midlands FMA in the Wombat State forest (CNR 1992a) addresses the impact of fuel-reduction burning on forest ecology. The results of this research will continue to provide a valuable basis for the development of fire management prescriptions that meet the requirements of both fire protection and ecosystem conservation. In addition, NRE in conjunction with Parks Victoria has established a Fire Ecology Working Group in order to promote the development of burning regimes taking into account ecological characteristics of plant and animal communities.

Heathy Dry Forest has been identified as a vulnerable EVC in the North East (VicRFASC 1999) due to both the past and continuing impacts of alterations in the timing, extent and frequency of fire. Approximately 57% of the current extent of Heathy Dry Forest on public land has been included in the Reserve System. Further protection through reservation of this extensive EVC is not practical and, in any event, will not address the identified threatening process, as fire occurs on all public land tenures. NRE, in consultation with Parks Victoria, will analyse the extent and frequency of fuel reduction burning in this EVC across all public land. Wherever possible, burning strategies that maintain or promote the ecological characteristics of the EVC will be developed and implemented through fire operations plans by 2004.

ACTIONS

Support further research into the role of fire in the conservation and management of forest vegetation communities.

Incorporate research findings on the impact of burning on ecosystem diversity into Fire Protection Plans, and in fuel reduction burning programs.

Develop ecological burning strategies for EVCs occurring in the North East in consultation with other public land managers.

Analyse the extent and frequency of fuel reduction burning programs and wildfire on Heathy Dry Forest and where possible, develop burning strategies that maintain or promote the ecological characteristics of the EVC by 2004.

Other potentially threatening processes

Other potentially threatening processes and management actions taken to address them are shown in Table 3.3. Processes listed (FFG listed) in the FFG Act will also be subject to an Action Statement or Management Plan prepared under the Act.

Table 3.3 Management actions for other potentially threatening processes

Process	Management Action
Alteration to the Natural Temperature Regimes of Rivers and Streams (FFG listed). Temperature affects the breeding success of a wide range of aquatic fauna.	Addressed by the *Code* requirement for the retention of a minimum 20 m buffer on all permanent streams. The shading this provides serves to minimise temperature variations that might otherwise result from additional exposure to the sun.
Alteration to the natural flow regimes of rivers and streams (FFG listed).	Addressed by the *Code* requirements.
Increase in Sediment Input into Victorian Rivers and Streams due to Human Activities (FFG listed). Excessive sedimentation interferes with many aquatic ecosystem processes.	Measures aimed at minimising sediment input to rivers and streams are described in Chapter 5 – *Catchments and Streams*.
Input of Toxic Substances into Victorian Rivers and Streams (FFG listed).	Addressed by the *Code* requirements for safe handling of fuel and lubricants which restricts the location and conduct of refuelling operations.
Prevention of passage of aquatic biota as a result of the presence of in stream structures (FFG listed).	Addressed by the *Code* requirements for road construction.
Degradation of native riparian vegetation along Victorian rivers and streams (FFG listed).	Addressed by the *Code* requirement for the retention of a minimum 20 m buffer on all permanent streams.
Predation of Native Wildlife by the Introduced Red Fox Vulpes vulpes *(FFG listed)* (CNR 1993c).	See Chapter 6 – *Forest Protection.* Ensure biodiversity aims are considered in pest control programs.
Predation of Native Wildlife by the Cat Felis catus *(FFG listed)* (NRE 1998b).	See Chapter 6 – *Forest Protection.* Ensure biodiversity aims are considered in pest control programs.
The invasion of native vegetation by environmental weeds (FFG listed).	See Chapter 6 – *Forest Protection*.
Use of Phytophthora-*infected Gravel in Construction of Roads, Bridges and Reservoirs (FFG listed).*	See Chapter 6 – *Forest Protection*.
Competition and Land Degradation caused by Feral Goats.	See Chapter 6 – *Forest Protection*.
Competition and Land Degradation by Feral Rabbits.	See Chapter 6 – *Forest Protection*.
Soil erosion and vegetation damage and disturbance in the alpine regions of Victoria caused by cattle grazing (FFG listed).	See Chapter 9 – *Other Forest Uses*.

3.5 SPECIES AND GENETIC DIVERSITY

The long-term protection of all forest flora and fauna populations is best achieved by protecting representative examples of all ecosystems, and by taking steps to minimise the impact of threatening processes. These approaches provide a base level of security for populations of most native flora and fauna (see sections 3.1–3.4). Some species, however, occur in very low numbers, in isolated populations, or are sensitive to forest management practices. These 'featured species' require specific action aimed at ensuring the survival of populations and, therefore, the maintenance of biodiversity. Featured species include those:

- listed as threatened under the FFG Act or the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. Some species (Long-footed Potoroo for example) have Action Statements and/or National Recovery Plans prepared under these Acts, with which the species conservation guidelines in this Plan are consistent;

- listed by NRE as *Victorian Rare or Threatened Plant Species* (VROTS) (DCE 1990a), or as *Threatened Vertebrate Fauna in Victoria* (NRE 2000) or invertebrates (CNR 1995h);
- listed as being endemic, disjunct or at the edge of range in the planning area (VicRFASC 1998b); or
- not listed in any of the above categories but which are sensitive to forest management activities and at risk of having their populations depleted and fragmented.

Genetic diversity refers to the variety of genetic information contained in all of the individual plants, animals and micro-organisms that inhabit our planet. Genetic diversity occurs within and between populations of organisms that comprise individual species as well as among species.

Protecting multiple populations across a species' range can conserve genetic diversity. This may also reduce the risk of the species being destroyed by natural disasters or other factors. Conservation of genetic diversity is best achieved through the maintenance of populations of all native flora and fauna across their natural range, and through the measures identified to avoid forest fragmentation. Populations of species that are rare, threatened, endemic, disjunct or at the edge of their range are likely to be genetically distinctive or unique, may also warrant special attention.

Featured flora conservation

There are approximately 166 vascular plant species recorded on public and private land in the North East which fall into one of the featured species categories. Management of flora that occurs in State forest is based on an assessment of the threat status of the species and the presence of populations in conservation reserves.

Additional rare or threatened flora species may be identified in the planning area as a consequence of additional flora surveys, or reviews of the conservation status of species and subsequent listing under the FFG Act. Management of such species will be determined following consultation with botanists, but will follow the general approach outlined in the Conservation Guideline for Featured Flora. Appendix K lists current management actions for threatened flora species occurring in State forest in the North East.

For many threatened flora species, there is limited knowledge regarding responses to different types of disturbance. NRE intends to establish a priority list of threatened flora species based on current information of species requirements, life history and distribution. Surveying and monitoring of these threatened flora will provide additional information that will assist in the management of these species.

Conservation Guideline
Featured flora

Include all known populations of species regarded as 'Endangered' at a Victorian or Australian level in the SPZ. The protection zone needs to be of sufficient size to include all of the local population, and should include a buffer large enough to protect the population from external impacts.

Include populations of Vulnerable, Rare, Depleted, Insufficiently Known, Endemic, Disjunct, and Edge of Range species in the SPZ or SMZ after consideration of their level of representation in the existing conservation reserve system. Species that are well represented in the formal reserve system or which are locally abundant and tolerant of disturbance may not warrant inclusion in the SPZ or SMZ.

Populations identified for protection should, wherever practicable, be included in larger parts of the SPZ or SMZ, in combination with other values.

Action Statements for species listed under the *Flora and Fauna Guarantee Act* 1988 or National Recovery Plans under the *Environment Protection and Biodiversity Conservation Act* 1999 will guide management of the species. If no Action Statement or Recovery Plan is available, species listed under the FFG Act will be managed in accordance with their conservation status and this guideline.

Isolated populations of featured flora species should be placed in the SMZ (200 m radius) to highlight their presence and the need for site inspections and more detailed planning. Any disturbances (including logging coupes, road construction and fuel-reduction burning) proposed in close proximity or within these sites, will be planned in consultation with NRE biologists to ensure that the species is adequately protected.

Where SPZ or SMZ is established for featured flora conservation in areas licensed for grazing, licences should be reviewed to determine potential impacts on protected species. Grazing activities should be modified or excluded if necessary.

The protection measures for individual flora species will be reviewed in light of new information on the species response to disturbance. As a result, protection measures for individual species or populations may be modified over time.

ACTIONS

Manage threatened forest flora in accordance with the Guidelines for Featured Flora Conservation, relevant legislation and policies and Appendix K.

Establish a list of priority threatened forest flora species and undertake surveys and monitoring of these species, and where necessary modify management actions in response to this new information.

Featured fauna conservation

Conservation guidelines have been developed for threatened or sensitive species with major habitat requirements in State forest, and whose needs may not be fully met by other conservation strategies. Application of these guidelines has helped to establish a network of protected habitat catering for all forest fauna of the North East. They do not form the basis of statewide fauna management, as other Forest Management Areas may differ in their specific requirements and situations. For FFG Act listed species, Action Statements establish a management program on a statewide basis.

The purpose of the guidelines is to:

- provide planned protection for sensitive and threatened species in State forest to meet the requirements of the FFG Act and the precautionary principle outlined in the National Forest Policy Statement;
- take account of the contribution of national parks and other conservation reserves towards meeting these requirements; and
- initiate an orderly process for ongoing reconciliation of timber production with conservation of threatened species.

In applying the guidelines, consideration will be given to the status of fauna records and the quality of habitat in the area. For example, a well-documented and substantial population of a threatened species warrants a higher priority for protection than an area of marginal habitat where the same species was incidentally recorded.

The guidelines establish comprehensive conservation strategies for the management of featured species in the North East State forests, which may be further developed as more information becomes available. Preparation and implementation of FFG Act action statements may require refinement of some guidelines in accordance with the processes outlined in Chapter 12. An integral part of the featured fauna management guidelines is to protect a defined number of individuals or habitat areas to meet their requirements. Depending on the species, this is done in one of two ways:

- **Minimum population level** – establishes a target number of protected records or habitat areas around which key habitat is maintained to ensure the maintenance of viable populations of the species in the planning area; or,
- **Review level** – establishes a pre-determined number of protected records or habitat areas which, once reached, will trigger a review of the species' forest conservation requirements to ensure their relevance and effectiveness.

Species most vulnerable to forest management and utilisation activities are those that:

- forage over large areas of forest (e.g. forest owls, Spot-tailed Quoll);
- are at or near the top of the food chain (e.g. forest owls, Spot-tailed Quoll, diurnal forest raptors);
- require combinations of varied specialised habitat resources for nesting, roosting, foraging, perching or basking (e.g. forest owls, parrots and cockatoos, possums and gliders, many insectivorous bats);
- naturally occur at low densities (e.g. higher order predators such as the Spot-tailed Quoll);
- are colonial or social in population structure (e.g. several forest bats and some birds); and
- occur in small populations and have specialised habitat requirements that may be disrupted by disturbance (e.g. Long-footed Potoroo, Spotted Tree Frog and the Bandy Bandy).

Conservation guidelines have been developed for the following rare or threatened fauna recorded in State forest in the study area. In addition, Appendix L provides prescriptions for a number of fauna species that do not warrant a conservation guideline but have specific habitat requirements that should be protected where records exist. Included in Appendix L are a number of rare or threatened fauna species that have been recorded in the planning area, however their preferred habitats are outside State forest. These include the Black Falcon, Grey-crowned Babbler and Eastern Water Skink.

Species with significant habitat requirements in State forest are discussed below.

Mammals

Long-footed Potoroo *Potorous longipes* **endangered, FFG listed**

The Long-footed Potoroo is a rat-kangaroo, which inhabits wet and damp forests. It depends on the fruiting bodies of underground fungi as a food source, and on a dense understorey for shelter from predators such as wild dogs and foxes. Initially thought to be confined to East Gippsland, Long-footed Potoroos have since been recorded in a small area of south-eastern NSW and in 1995, a population was discovered in the Barry Mountains of North East Victoria. Each of the three sub-populations is small and therefore vulnerable to the effects of disturbance such as wildfire or timber harvesting.

Approaches to Long-footed Potoroo conservation are discussed in the management strategy (Saxon *et al.* 1994) and the Flora and Fauna Guarantee Action Statement (CNR 1994a) both prepared for the East Gippsland sub-population. Since their publication, the species has been discovered in North East Victoria (Jones and Johnson 1997) and a National Recovery Plan has been prepared (Environment Australia in prep). The Action Statement is also currently being revised. Both documents emphasise control of feral predators, prevention of habitat disturbance and outline a research program to help refine management over time.

The Action Statement and National Recovery Plan provide a framework for managing the risk to Long-footed Potoroos according to the status of local populations and the state of knowledge about their response to disturbance. It defines populations, sub-populations and colonies. One Long-footed Potoroo population is recognised and three sub-populations have been located in East Gippsland, North East Victoria and South East NSW. The Victorian sub-populations each contain numerous colonies. The status of the species has been assessed using IUCN criteria as Endangered. The North East sub-population is considered to be Endangered. The Long-footed Potoroo has been recorded in both State forest and National Park. Accordingly, future surveys should be undertaken across both land tenures to supplement the current knowledge regarding the species' distribution in the North East.

Protection measures for the North East population are outlined in the North East Regional Forest Agreement (VicRFASC 1999) and are described in more detail in the conservation guideline below.

Conservation Guideline

Long-footed Potoroo

Conservation of Long-footed Potoroo sub-populations will be guided by the FFG Act Action Statement, the National Recovery Plan (Environment Australia in prep), recent research (Jones 1999) and the North East Regional Forest Agreement (VicRFASC 1999). Potoroos in North East Victoria are considered to be a single sub-population.

Habitat protection will include a consolidated area of State forest and National Park centred upon the Humffray River and Riley Creek catchments. The consolidated area of approximately 25 700 hectares incorporates the area supporting the greatest density of Long-footed Potoroo records (confirmed sites) in the North East (Jones 1999) and EVCs considered to be preferred habitat. In addition, a number of existing Special Management Areas (SMAs) of 400–500 hectare sub-catchment areas within the Alpine National Park and State forest that are not contiguous with the Humffray/Riley consolidated area will also contribute to the protection of Long-footed Potoroo habitat. These SMAs combined total approximately 3 300 ha and together with the consolidated area protect around 29 000 ha which includes the highest quality habitat for the Long-footed Potoroo.

Confirmed sites are those where potoroos are trapped, where their remains, footprints, hair or nests are detected, or where sightings are made by suitably qualified biologists. Diggings or remains in predator scats are indicative of the presence of potoroos but are not regarded as confirmed sites.

continued next page

Conservation Guideline – Long-footed Potoroo - continued

Generally, habitat includes forest with relatively high soil moisture content that supports an abundance of hypogeal fungi and a dense understorey providing shelter from predators. Suitable habitat is typically found within Wet Forest, Damp Forest and Riparian Forest.

SMAs in State forest will be included in the SMZ, or in the SPZ, where they coincide with other values. Timber harvesting and new roading will be excluded. Fuel-reduction burning will be excluded unless burning is essential for protection of life and property (for example in close proximity to a settled area).

If new records are found outside the areas shown on Map 1 the following procedure will be followed. All confirmed sites have priorities established for habitat quality, population size and reserve design considerations. The consolidated area is considered to include the highest priority sites. New high priority sites may be substituted, either completely or partially, for existing lower priority SMAs outside the consolidated area providing there is no net deterioration of the habitat values currently protected. The protection for lower quality sites should be modified SMAs of approximately 150 hectares of suitable habitat, however, they should not create a net addition to the area of SPZ or SMZ.

Consistent with the Long-footed Potoroo Action Statement, National Recovery Plan and North East RFA, the total area of forest protected in accordance with this strategy comprises at least 17 500 hectares of State forest and National Park (considered sufficient for about 1000 individuals).

Where timber harvesting is scheduled adjacent to confirmed Potoroo habitat, predator control should be undertaken along tracks to prevent predators such as dogs and foxes gaining access to the area.

This strategy will be reviewed in light of research on the species response to habitat disturbance.

NOTE: Generally, Long-footed Potoroo SMAs have been placed in the SMZ. Potoroos have been recorded in regrowth forest and some carefully planned timber harvesting may be compatible with their conservation. Research on the species needs to be further advanced before any harvesting can be permitted in these areas. A research project to investigate the impacts of habitat disturbance by logging on the Long-footed Potoroo has commenced in East Gippsland. The results from this research may assist in developing improved forest management practices by clarifying the effects of disturbance on the species.

ACTIONS

Continue to ensure conservation of the Long-footed Potoroo through implementation of the Action Statement, National Recovery Plan and the Conservation Guidelines for Long-footed Potoroo.

Undertake strategic surveying for the North East Long-footed Potoroo sub-population across public land to ascertain the species' distribution across the landscape.

Continue targeted predator control and population monitoring of the Long-footed Potoroo sub-population.

Incorporate relevant findings, as they become available, from the habitat disturbance research being carried out in East Gippsland, into conservation and harvesting strategies where appropriate.

Spot-tailed Quoll *Dasyurus maculatus* **endangered, FFG listed**

The Spot-tailed Quoll is the largest carnivorous marsupial on the mainland. It is a high-order predator with a large home range. Quolls establish dens in rocky outcrops, hollow logs and may also use windrows. Quolls are generally solitary animals and are considered to be sparsely distributed in the forested areas of Victoria. Since 1980, Quolls have been located from two sites in State forest in the North East. The impact of forest management operations on Spot-tailed Quolls is poorly known. Pest control activities using 1080 (Sodium monofluoroacetate) poison are believed to be a potentially important factor in their decline.

This guideline adopts a precautionary approach and builds on the FFG Act Action Statement for the species (CNR 1992c), providing areas of undisturbed forest as foraging habitat until further work on habitat requirements and threats is completed. A review of the FFG Act Action Statement is in preparation to incorporate new information that will be developed from further work described above.

Due to the cryptic nature of the species, fauna surveys that specifically target Spot-tailed Quolls will assist in identifying the habitat requirements and range of the species. Priority for these surveys will be given to existing reserves and SPZ, where likely habitat may be found.

Conservation Guideline

Spot-tailed Quoll

- For each confirmed record establish a SPZ of approximately 500 ha that should include the detection site. The SPZ should include undisturbed mature forest, riparian areas and rocky outcrops where possible.
- In addition to the SPZ, a SMZ of approximately 1 000 ha contiguous to the SPZ will be established. The objectives of the SMZ will be to maintain habitat for both arboreal and non-arboreal Spot-tailed Quoll prey, while providing continuing opportunities for timber production.
- Where harvesting is proposed within the SMZ, a SMZ plan must be prepared before operations commence.
- Harvesting within the SMZ may comprise selective harvesting operations over the entire area, or carefully sited and scheduled seed tree, or clearfall harvesting, ensuring, in either case that important prey habitat components such as hollow-bearing trees are retained. Where clearfall or seedtree harvesting systems are proposed, harvesting operations may, through time, extend over the entire SMZ. However, harvesting must be scheduled to ensure at least 500 ha of suitable prey habitat is available at any point in time (in addition to the SPZ).
- The adoption of harvesting strategies for SMZs should have regard to the following:
  - assessed significance of the zone as Spot-tailed Quoll habitat;
  - existing patterns of public land use and forest zoning;
  - silvicultural characteristics of forest types in the zone;
  - proportion of the zone which is unproductive for sawlog production; and
  - the timber resource values of the productive areas.
- In accordance with the Action Statement establish a 200 m radius SPZ around latrine and den sites where they are not otherwise protected.
- In order to minimise the risk of accidental poisoning, predator control programs using poisons such as 1080 will be conducted in accordance with the pest animal guidelines detailed in Chapter 6 – *Forest Protection.*
- Review this guideline when either 10 zones have been established in State forest or the Action Statement is revised.

ACTION

Conduct surveys for Spot-tailed Quoll, across all public land tenures, to assist in identifying range of the species within the North East and its habitat requirements.

Squirrel Glider *Petaurus norfolcensis* **endangered, FFG listed**

The Squirrel Glider is a nocturnal, arboreal gliding possum that feeds predominantly on nectar, pollen, sap and arthropods (Sharpe and Coldingay 1998). Squirrel Gliders prefer open forest and woodland supporting a mixture of *Eucalyptus* species, including gum-barked species and *Acacia* species in the understorey. They nest and roost in tree hollows. Records from the North East are generally from rural remnant habitats. Threats include habitat fragmentation, depletion of tree hollows and predation. Records of the species on public land in the North East are confined to Chiltern National Park and Mount Pilot Multi Purpose Park. There are currently no Squirrel Glider populations recorded in North East State forest.

Conservation Guideline
Squirrel Glider

- Establish a SMZ of approximately 500 ha in the vicinity of confirmed populations containing a core area of approximately 100 ha, which will be excluded from timber harvesting.
- Establish management prescriptions for Squirrel Glider SMZs which will include measures aimed at maintaining key habitat elements such as nesting hollows, large trees and suitable understorey species, in particular Silver Wattle (*A. dealbata*).
- Timber harvesting, fuel reduction burning and road construction may proceed following the preparation of a SMZ plan that establishes habitat protection prescriptions.
- Review this guideline when 10 zones have been established in State forest.

Brush-tailed Phascogale (Tuan) *Phascogale tapoatafa* **vulnerable, FFG listed**

The Brush-tailed Phascogale is a small, mainly arboreal, carnivorous marsupial that prefers dry, open sclerophyll forests with rough-barked trees and occupies a large home range, extending up to 100 ha. They feed mainly on insects and other arthropods. Nests are constructed in tree hollows, stumps and fallen logs. Most males die after mating so conservation of the species rests largely on the maintenance of populations of breeding females, however, females generally survive for less than two years.

Potential threats include habitat fragmentation, depletion of tree hollows, predation by foxes and cats and removal of fallen timber in firewood harvesting operations or frequent fire. Distribution of the species is fragmented with records extending from the west of the state (excluding the Otways and Grampians), to East Gippsland; however, there have been no records from Gippsland for over 25 years. Currently, there are no records of this species in State forest within the North East. An Action Statement has been prepared for the species (NRE 1997a).

Conservation Guideline
Brush-tailed Phascogale

In accordance with the Action Statement:

- identify, on the basis of confirmed records and as part of a statewide program, 'Priority management areas' (PMAs) of at least 1 000 ha which may include conservation reserves or State forest where appropriate. In State forest, PMAs will be established as SMZ;
- in PMAs in State forest, prescriptions relating to appropriate fuel reduction burning practices, tree retention, grazing and removal of fallen timber will be prepared to enhance conservation of the species. A SMZ plan will need to be prepared prior to fuel reduction burning or timber harvesting operations (including firewood harvesting);
- predator control works for foxes and cats should be considered where predation is considered a threat and should be conducted in accordance with the feral animal guidelines detailed in Chapter 6 – *Forest Protection*.

Smoky Mouse *Pseudomys fumeus* **endangered, FFG listed**

Populations of the Smoky Mouse within Victoria are disjunct, with records from the Grampians, Central Highlands, Barry Mountains and coastal Gippsland. In the North East, the Smoky Mouse has been recorded in the vicinity of Mounts Terrible, Cobbler and McDonald. Knowledge of the distribution of this species is based on fauna surveys carried out in the late 1970s. Since this time, few records have been added to the database. The most recent records of the species were obtained during the North East fauna survey conducted in 1996 where Smoky Mouse was located at two sites. The North East planning area accounts for 20% of all records known from Victoria (NRE 1998a).

The Smoky Mouse has been recorded from a variety of forest types with a heath understorey. Seeds, berries and underground fungi are reputedly the major food items. Fire probably plays an important role in maintaining the structural diversity and floristic composition of the ground and shrub vegetation suitable for this species. However, the most appropriate fire intensity and frequency needed to satisfy the ecological requirements of this species have yet to be established.

Threats may include predation by foxes and cats, inappropriate fire regimes and timber removal that may result in changes to understorey floristics and structure. Home range size has been determined for the Grampians population, but extrapolation of these figures to the North East situation may not be valid. Research is required to establish the key foraging components used by Smoky Mouse and how they are influenced by fire.

Conservation Guideline
Smoky Mouse

- For each confirmed record, establish a SMZ of approximately 100 ha incorporating the detection site wherever possible.
- Timber harvesting and road construction may proceed following the preparation of a SMZ plan. This Plan should incorporate any relevant information collected in the recent study of this species in Gippsland Region.
- Prescribed burning at known Smoky Mouse localities should be restricted to frequencies greater than 8 years.
- This strategy should be reviewed after the establishment of 10 SMZs or in light of further research regarding the conservation status of the species and its response to disturbance.

Southern Bent wing Bat *Miniopterus schreibersii* **vulnerable, FFG listed**

Southern Bent-wing Bats breed in only a few localities in Victoria; the stronghold for this species appears to be in East Gippsland (where an estimated 60 000 individuals have been recorded in Nargun Cave) and parts of West Victoria. Limited records exist for the North East planning area, mainly north west of Mitta Mitta and the southern Strathbogie Ranges. It has also been recorded in State forest around Kevington. The planning area accounts for less than 1% of all records known from Victoria. No maternity sites are known for the planning area.

Caves and mine shafts are essential roosting and breeding sites for this species. No individuals have been found to use tree hollows. Specific foraging requirements of the species are not yet known, but it is presumed to prefer native vegetation.

Although large distances have been recorded between maternity and roost site, the precise home range requirements of the species are not known. The potential home range size may therefore be quite large.

Direct disturbance to the roost site (or mineshaft) would adversely affect the population's survival. Intentional closure of mine shafts, even using standard 'bat gates', may hinder flight of this species and cause desertion of the roost. Feral cats and foxes may prey on the species as they fly in or out of mine entrances.

Conservation Guideline
Southern Bent-wing Bat

Establish a SPZ buffer of 100 m around all breeding and roosting caves and mines and known over-wintering sites. Sites will not be publicised and visitors will generally be discouraged, except as part of planned interpretive activities.

Where mine safety requires the closure of mines, signage and fencing away from the mine entrance should be erected to exclude disturbance and protect roost and breeding sites. The fence should be designed so as not to cover the entrance to ensure that flight movement of the species is not hindered.

Southern Horseshoe Bat *Rhinolophus megaphyllus* **vulnerable, FFG listed**

The Southern Horseshoe Bat has been recorded in the Strathbogie State forest and Mount Samaria State Park. The North East planning area accounts for 1% of all records known from Victoria. This species is a slow-flying bat that appears to forage through the understorey. Specific foraging requirements of the species are unknown; however, it appears to prefer forested areas.

There are no records of this species using tree hollows. Roost sites have been detected within caves and mines. Deep, natural caves are preferred, although mine sites are more likely to be available in the planning area. A mineshaft in Mount Samaria State Park is used by this species. Surveys conducted in 1996 and 1997 indicate that Mount Barranhet is an important locality for the Southern Horseshoe Bat. A monitoring site has been established at Mount Barranhet where juveniles and pregnant females have recently been captured. This may indicate a maternity site in the vicinity.

The Southern Horseshoe Bat does not routinely fly large distances and is assumed to travel only some kilometres within its range. Direct disturbance to the roost site (or cave) could adversely affect the long-term survival of the local population. Evidence from old gold mines north east of Melbourne suggest that re-working of mines and natural collapse of entrances may have contributed to the disappearance of these bats. Intentional closure of mine shafts using inappropriate gates may hinder flight of this species and cause desertion of the roost. Cats and foxes may prey on the species in caves and capture them while they fly close to the ground.

Conservation Guideline
Southern Horseshoe Bat

Establish a 100 m buffer SPZ around all breeding and roosting caves and mines and known over-wintering sites. Sites will not be publicised and visitors will generally be discouraged, except as part of planned interpretive activities.

Where mine safety requires the closure of mines, specially designed 'bat gates' should be erected to exclude disturbance and protect roost and breeding sites. Bat gates should be monitored to ensure that flight movement of the species is not hindered.

Southern Myotis *Myotis macropus* **lower risk – near threatened, FFG listed**

The Central Highlands appear to be a stronghold for the Southern Myotis in Victoria. Elsewhere in the State, records are widely distributed, but typically, the species occurs in low numbers. The North East planning area accounts for 8% of all records known from Victoria (NRE 1998a). The Southern Myotis has been recorded roosting in caves, aqueduct tunnels and tree hollows. The only known breeding population in the North East has been recorded within State forest along the Goulburn River near Kevington. Roost sites have been located on the Jamieson and Big Rivers. Recent research conducted in the North East area has found nine roosting sites—nine dead hollow trees standing in Lake Eildon (Caddle, C. January 1998. Department of Zoology, The University of Melbourne. pers comm.) Targeted searches over water would provide a better understanding of the species' distribution in the planning area.

Slow-flowing lowland streams, at an altitude of less than 300 m, appear to be the preferred habitat for this species. Current information indicates that the Southern Myotis forages almost exclusively over water, feeding primarily on aquatic insects and small fish. Permanent water bodies are important foraging substrates. The removal of hollow-bearing trees is a potentially threatening process that may deplete numbers of available roost sites.

Conservation Guideline
Southern Myotis

Establish a 300 m buffer of SPZ around confirmed breeding and roost sites.

Establish a lineal SPZ consisting of 200 m either side of the Goulburn River in State forest.

Review the above guideline after the location of 20 sites or significant information has been obtained from further research.

Birds

Barking Owl *Ninox connivens* **endangered, recommended for FFG listing**

Barking Owls exhibit a preference for dry open forests and River Red Gum forests. The species requires tree hollows for breeding and roosting sites and hunts for prey on the forest floor and amongst the canopy. Barking Owls appear to be widely distributed but at low densities north of the Divide. Of the 57 current records of Barking Owls in the planning area, 33 occur on public land (NRE 1998a).

Conservation Guideline
Barking Owl

- Within a 3.5 km radius of a Barking Owl confirmed record, approximately 300–500 ha of suitable forest, including the detection site where possible, will be reserved from harvesting. This may be in the form of existing conservation reserves, or where necessary, areas of State forest SPZ.
- Review this strategy once 10 sites have been identified in public land in the North East.

Masked Owl *Tyto novaehollandiae* **endangered, FFG listed**

The Masked Owl is a large forest owl that has been recorded in Herb-rich Foothill Forest and Grassy Dry Forest; although very few records exist. The species requires tree hollows for nesting and roosting sites and hunts for prey amongst the forest canopy. Due to its similar appearance and habitat preference, it can sometimes be confused with Sooty Owls. The Masked Owl has been recorded on only two occasions in the North East. Current knowledge about this owl indicates that it is unlikely to occur over much of the North East planning area. An Action Statement is in preparation for this species.

Conservation Guideline

Masked Owl

- Within a 3.5 km radius of a Masked Owl confirmed record, approximately 500 ha of mature forest will be reserved from harvesting (this may be in the form of existing conservation reserves or, where necessary, areas of State forest SPZ). Patches of suitable habitat, greater than 100 ha in area and contiguous where possible should be selected.
- Review this strategy once 10 sites have been identified on public land in the North East.

Sooty Owl *Tyto tenebricosa* **vulnerable, FFG listed**

The Sooty Owl is a large forest owl that exhibits a preference for closed forests and tall open forests. It is fiercely territorial and occupies a large home range. The species requires tree hollows for nesting sites and arboreal mammals form a large part of its diet. The general strategy for conservation of the Sooty Owl is to protect core habitat for a minimum of 100 pairs of Sooty Owls in the North East by delineating Sooty Owl Management Zones (SOMAs). In addition, undisturbed Sooty Owl habitat in the forested areas outside of SOMAs will be provided by conservation areas, steep slopes, non-commercial areas and retained vegetation along streams within the GMZ.

SOMAs will be based on suitable habitat, which has been identified using a predictive habitat model (NRE in prep-a). SOMAs are based on confirmed records (breeding sites, roosts and sightings) or areas of suitable habitat identified by the model in conservation reserves, State forest or other suitable public land areas. See Appendix M for a description of the modelling process. The target number is based on estimates of the viable population of Sooty Owls in Victoria and the proportion of Victorian Sooty Owl habitat in the North East planning area. An Action Statement is in preparation for the conservation of the Sooty Owl.

Conservation Guideline

Sooty Owl

- Establish and maintain 100 SOMAs each protecting approximately 500 ha of good quality habitat within a circle of 3.5 km radius. SOMAs may be established in existing conservation reserves or, where necessary, areas of State forest SPZ. Patches of suitable habitat, greater than 100 ha in area and contiguous where possible should be selected.
- In establishing SOMAs, preference should be given to protecting the best quality habitat near known records, subject to other forest management objectives. Alternatively, SOMAs may be established in areas modelled as providing high quality habitat.
- Where new records are identified, new SOMAs may be established to replace existing SOMAs where they are considered to be of lesser value, subject to other management objectives.

Powerful Owl *Ninox strenua* **endangered, FFG listed**

The Powerful Owl is the largest owl found in Australia and is considered uncommon to rare throughout its range. It is classified as Endangered. In Victoria, it has been recorded in a wide range of forest types and from most of the State with the exception of the drier north-west and most of the riverine Red Gum forests (NRE 1998a). Powerful Owls occupy and defend large territories leading to a low population density. The Powerful Owl is nocturnal and preys mainly on arboreal or semi-arboreal marsupials. The species prefers older forests where large tree hollows provide nesting sites and arboreal prey. The reduction in forest cover in Victoria has led to loss of habitat and an overall reduction in owl numbers. Powerful Owls are vulnerable to disturbances that further reduce habitat such as land clearing and timber harvesting.

A Flora and Fauna Guarantee Action Statement has been prepared for the Powerful Owl (NRE in prep-b). The general strategy for conservation of the Powerful Owl is similar to that of the Sooty Owl. It is designed to protect core habitat for a minimum of 125 pairs in the North East by delineating Powerful Owl Management Zones (POMAs). In addition, undisturbed Powerful Owl habitat in the forested areas outside of POMAs will be provided by conservation areas, steep slopes, non-commercial areas and retained vegetation along streams within the GMZ.

POMAs will be based on suitable habitat, which has been identified using a predictive habitat model (NRE in prep-a). POMAs are based on confirmed records (breeding sites, roosts and sightings) or areas of suitable habitat identified by the model in conservation reserves, State forest or other suitable public land areas. See Appendix M for a description of the modelling process. The target number is based on estimates of the viable population of Powerful Owls in Victoria and the proportion of Victorian Powerful Owl habitat in the North East planning area.

Conservation Guideline
Powerful Owl

- Establish and maintain 125 POMAs each protecting approximately 500 ha of good quality habitat within a circle of 3.5 km radius. POMAs may be established in existing conservation reserves or, where necessary, areas of State forest SPZ. Patches of suitable habitat, greater than 100 ha in area and contiguous where possible should be selected.
- In establishing POMAs, preference should be given to protecting the best quality habitat near known records, subject to other forest management objectives. Alternatively, POMAs may be established in areas modelled as providing high quality habitat.
- Where new records are identified, new POMAs may be established to replace existing POMAs where they are considered to be of lesser value, subject to other management objectives.

Amphibians

Spotted Tree Frog *Litoria spenceri* **critically endangered, FFG listed**

Spotted Tree Frogs inhabit rocky, swift flowing streams in the Eastern Highlands. They lay their eggs under boulders in streams and use streamside vegetation for shelter and basking. Extensive surveys in recent years have only located 12 extant populations, 11 from Victoria and one from Kosciuszko National Park in NSW. It is presumed extinct from four more streams where it was previously recorded. Seven of the extant populations are within the North East area.

The Spotted Tree Frog is thought to be threatened by a range of processes. These may include predation of eggs and tadpoles by introduced trout (the species is unpalatable to native fish), disturbance to habitat by campers and anglers and potential increases to stream sedimentation from roads and timber harvesting activities. Sediment deposition could affect breeding success by filling in the gaps between rocks and pebbles where eggs are laid.

O'Shaughnessy (O'Shaughnessy and Associates 1995) emphasised that roads and tracks are the most likely source of any significant changes to stream sedimentation in catchments. Stream crossing points and roads built prior to introduction of the *Code* are of greatest concern. The recommendations of that report have been incorporated in the Action Statement (NRE in prep-c) and the Conservation Guidelines of this Plan. Table 3.4 lists the stream buffer widths recommended by (O'Shaughnessy and Associates 1995) and are included in the conservation measures for this species.

Table 3.4 Minimum stream buffer widths for timber harvesting within 1 km of known Spotted Tree Frog Locations[1]

Stream class	Soils with high permeability[2] and low potential for overland flow	Soils with low permeability[2] and high potential for overland flow	
	Slope[3] 0–30°	Slope[3] 0–20°	Slope[3] 21–30°
Permanent streams	30m B	40m B	50m B
Temporary streams	20m B + 10m F	20m B + 20m F	30m B + 20m F
Drainage lines	10m F	10m F	15m F
Wetlands	30m B	40m B	50m B

Note: Minimum stream buffer and filter strip widths (metres) to be applied one kilometre upstream of Spotted Tree Frog locations. B=Buffer strip. F=filter strip in which harvesting is permitted but without machine entry.

1. The prescriptions described here are also applied to streams upstream of known populations of Barred and Mountain Galaxias.
2. Soil permeability is based on the post harvest condition of the coupe (excluding landings and major snig tracks) for all but intense storm events.
3. Slope should be generally regarded as the average slope of coupe areas in the vicinity of the stream.

Conservation Guideline

Spotted Tree Frog

The emphasis of management will be to prevent disturbance of known sites, reduce any risks of increased stream siltation and improve control over recreation activities. Accordingly, the following special management arrangements will apply in catchments where the species has been recorded.

Until the species' critical habitat is known, a 300 m habitat protection zone on both sides of streams will be protected at confirmed frog sites and mapped habitat areas. The habitat protection zone will be included in the SPZ and timber harvesting, road construction and other potentially threatening activities (such as prescribed fire) will be excluded from the protection zone.

In addition, a further 700 m either side of the SPZ, and for 1 km upstream or to the ridge top (if less than 1 km) along all streams that flow into the frog habitat, will be included in the SMZ where the following prescriptions will apply:

- stream buffers and filter strip widths should be in accordance with Table 3.4 for any timber harvesting;
- no new stream crossings should be constructed;

continued next page

Conservation Guideline – Spotted Tree Frog - continued

- new roads (and the fill slope toe of any new road) in the management zone to be at least 50 m from any stream, unless site specific sediment management operations are put in place to prevent sediments entering perennial and ephemeral streams in the management zone; and
- recreational fishing and camping will be discouraged within the buffer zones to avoid disturbance of sites and habitat.

Areas within the catchment upstream of the SMZ (i.e. beyond 1 km), will have the following prescriptions:

- new roads (and the fill slope toe of any new road) to be at least 50 m from any stream, unless site specific sediment management operations are put in place to prevent sediments entering perennial and ephemeral streams in the management zone;
- the number of new roads or stream crossings should be minimised and constructed in accordance with the recommendations described in O'Shaughnessy and Associates (1997);
- all roads and tracks not required for management, harvesting or protection purposes will be progressively closed and rehabilitated (see Chapter 10 – *Forest Roads*);
- all remaining existing roads and stream crossings to be assessed and be subject to upgrading or modification, where required according to O'Shaughnessy and Associates (1997); and
- timber harvesting, roading and fuel reduction burning will be scheduled so that the area disturbed at any one time is minimised.

Roads and stream crossings within the SPZ and SMZ constructed prior to the introduction of the *Code* should be reviewed. Road works that result in a net reduction of stream siltation or reduce the risk for siltation should be undertaken in consultation with NRE biologists.

A Strategic Roading Plan will be developed for all Spotted Tree Frog SMZ catchments in recognition that the construction of roads and tracks may be a primary source of stream sedimentation. These plans should be completed prior to inclusion in WUPs.

Catchments in which mineral exploration and mining activities may affect Spotted Tree Frog habitat will have the following prescriptions to prevent habitat disturbance and changes in water quality (particularly sediment levels) and quantity in streams:

- strict enforcement of the ban on eductor dredging at all Spotted Tree Frog streams;
- prescriptions to protect Spotted Tree Frog habitat, as described above, should be included in licence conditions for exploration licences;
- mining proposals should be rigorously assessed in all catchments where these activities may affect Spotted Tree Frog habitat; and suitable management prescriptions to prevent direct and indirect disturbances to frogs and their habitat should be developed in addition to those above.

Reptiles

Bandy Bandy *Vermicella annulata*

lower risk – near threatened, recommended for FFG listing

The Bandy Bandy is a nocturnal, fossorial snake primarily found on drier northern slopes, but key habitat requirements are unknown. Specimens have been observed sheltering under large rock outcrops and activity appears to increase during the warmer months. Stomach content analysis of museum specimens of the Bandy Bandy has shown this species feeds solely on Woodland Blind Snakes (which uses hollows), which in turn, feeds almost exclusively on ants and termites.

Only a few records of the Bandy Bandy have been recorded from three disjunct populations in Victoria. These include the Mallee, small remnants in the Goldfields and isolated localities within the North East where it has been recorded in State forest around Beechworth. The North East planning area accounts for approximately 7% of all records known from Victoria (NRE 1998a). Current information indicates that the limiting resource for this species may be the availability of Woodland Blind Snake as a food resource.

Although research is required to identify specific habitat components, which are essential for the survival of both the Bandy Bandy and blind snakes, sufficient ground cover is essential to protect against predation. Any reduction in vegetation cover or litter could increase the vulnerability of the species to predation. Prescribed burning that depletes natural ground cover could also increase predator pressures.

Conservation Guideline

Bandy Bandy

SPZs are to be established around and including confirmed records.

Each SPZ should be approximately 50 ha in size and where practicable, incorporate the detection site.

Within the SPZ, rock collection (often for ornamental landscaping), timber harvesting, road construction and other potentially threatening activities should be excluded. Where fuel reduction burning is proposed in SPZ for Bandy Bandy, prescriptions should be prepared prior to operations commencing.

This strategy will be reviewed when 20 SPZs have been established.

Woodland Blind Snake *Ramphotyphlops proximus* **vulnerable**

Woodland Blind Snakes are a small (50–60 cm in length), non-venomous snake. They are fossorial, living within loamy soils, beneath rock or rotting logs. Nocturnal by nature, they are rarely seen on the surface, occasionally coming out on humid nights. They exhibit many adaptations of burrowing. Their heads are blunt and are indistinct, the tail is extremely short and their eyes are reduced in size.

Woodland Blind Snakes feed primarily on the eggs, larvae and pupae of ant species. Termites may be taken on occasions (Shine 1998).

There are very few records of Woodland Blind Snakes in the North East.

As little is known regarding the key habitat requirements of the Woodland Blind Snake research is required. Like the Bandy Bandy, Woodland Blind Snakes require sufficient ground cover to protect against predation. They may be vulnerable to any reduction in vegetation cover or litter. Activities that deplete natural ground cover, such as prescribed burning could increase predator pressures.

Conservation Guideline
Woodland Blind Snake

SPZs are to be established to protect all confirmed records.

Each SPZ should be approximately 50 ha in size and where practicable, incorporate the detection site.

Within the SPZ, rock collection (often for ornamental landscaping), timber harvesting, road construction and other potentially threatening activities should be excluded. Where fuel reduction burning is proposed in SPZ for Woodland Blind Snake, prescriptions should be prepared prior to operations commencing.

This strategy will be reviewed when 20 SPZs have been established.

Mountain Galaxias *Galaxias olidus* **data deficient**

Mountain Galaxias are a small fish, usually only 60–70 mm and seldom reaching longer than 145 mm in length. They vary in colour from yellowish-green to brown above and olive to silvery white below. They are usually found at moderate to high elevations (up to 1 800 m altitude) where they can tolerate near freezing water temperatures.

Mountain Galaxias inhabit small streams that have clear flowing water and gravel, sand or boulder substrates. Their populations are concentrated at headwaters, where trout are often absent and there is abundant in-stream cover. They depend on aquatic invertebrates as their main food source. Removal of streamside vegetation can reduce availability of this food source.

Little is known regarding the life cycle of Mountain Galaxias. Breeding is thought to occur between winter and summer and may extend into autumn in some alpine areas.

Although widespread, their distribution appears to be highly fragmented. This fragmentation has been attributed to the introduction of trout, which compete directly with Mountain Galaxias for habitat and food resources. However, predation of Mountain Galaxias by trout may be the main factor influencing their distribution.

Conservation measures in State forest focus on minimising the risk of sedimentation that may arise from roads and forest operations to ensure no additional pressures are placed on already depleted populations.

Conservation Guideline
Mountain Galaxias

The following conservation measures will be adopted:

- increase permanent and temporary stream buffers for 1 km upstream of Galaxias sites according to Table 3.4 (Spotted Tree Frog Table);
- progressively close and rehabilitate all roads or tracks not required for forest management, harvesting or protection purposes in catchments containing Mountain Galaxias;
- where appropriate, seasonally close roads in catchments containing Mountain Galaxias; and
- minimise stream crossings over permanent and temporary streams and drainage lines in catchments containing Mountain Galaxias.

Barred Galaxias *Galaxias olidus* var. *fuscus* **critically endangered, FFG listed**

The Barred Galaxias is a variety of the Mountain Galaxias. It is larger than other Galaxias, reaching a maximum of 160 mm in length. It is distinguished by an orange to yellow base colour overlayed by 10 distinct black vertical bars on either side of the body. The Barred Galaxias is restricted to streams above 400 m elevation. It is currently known from only one locality in each of 12 streams, all in the headwaters of the Goulburn River system. It appears that the present distribution represents the fragmentation of a previously much wider range.

Like Mountain Galaxias, Barred Galaxias inhabit small streams that have clear flowing water and gravel, sand or boulder substrate. Their populations are concentrated at headwaters, where trout are often absent and there is abundant in-stream cover in the form of undercut banks, submerged tree roots and wood debris.

The species appears to be non-migratory and spawning occurs in late winter to early spring. Little is known regarding the nature of spawning sites utilised by the Barred Galaxias (Raadik *et al*. 1996).

Conservation Guideline
Barred Galaxias

An Action Statement has been prepared (CNR 1995b) and provides the basis for conservation of this species. Consistent with the aims of the Action Statement, the following conservation measures will also be adopted:

- increase permanent and temporary stream buffers upstream of Galaxias sites according to Table 3.4 (Spotted Tree Frog Table);
- progressively close and rehabilitate all roads or tracks not required for forest management, harvesting or protection purposes in catchments containing Barred Galaxias;
- where appropriate, seasonally close roads in catchments containing Barred Galaxias; and
- minimise stream crossings over permanent and temporary streams and drainage lines in catchments containing Barred Galaxias.

Alpine (Stirling) Stonefly *Thaumatoperla flaveola* **vulnerable, FFG listed**

The Stirling Stonefly is a large eustheniid stonefly known only from streams on Mount Buller and Mount Stirling. It is most abundant in streams with low flow, composed of a series of terraces separated by steep sections. The species is probably long lived, spending a number of years with the stream system as juveniles before emerging as reproductive adults. Adults have reduced powers of flight and hence, a low ability to recolonise if disturbed.

Conservation Guideline
Alpine Stonefly

Where timber harvesting is scheduled in areas adjacent to Stirling Stonefly habitat (Upper reaches of the King and Delatite Rivers), the following buffer and filter strip widths will apply:

- permanent streams forming the boundary of a logging coupe will have a minimum buffer width of 50 m;
- permanent streams within the boundary of a logging coupe will have a minimum buffer width of 30 m either side of the stream. Where a permanent stream commences within a coupe, the buffer will be applied for a distance of 30 m above the head of the stream; and
- all drainage lines will have a minimum filter strip width of 15 m. The filter strip will also extend for 15 m above the head of the drainage line.

3.6 BIODIVERSITY MONITORING

Monitoring is an integral component of NRE's Ecologically Sustainable Forest Management system. It provides information on the relative success of forest biodiversity management programs and provides a basis for review and improvement of these programs.

NRE faces a number of challenges in the design and implementation of biodiversity monitoring programs. These include the need to adopt programs that are:

- related to forest management objectives
- of known and appropriate statistical power for detecting changes in the condition of forest assets or relationships between planning goals and related outcomes;
- relevant to current management practices and strategies and are able to inform decisions about changes in approach;
- accepted by stakeholders; and
- cost-effective and practical to implement.

The currently favoured approach is to select species or processes that allow broader conclusions to be drawn about the condition of forests. The species vulnerability assessment for the North East Comprehensive Regional Assessment identifies relevant species according to four criteria: rarity; population dynamics; spatial dynamics; and, life history parameters. Additionally, consideration needs to be given to habitat requirements at the population level, including the scale at which these operate. Potential candidates for monitoring include:

- Large forest owls which range over large areas, are directly sensitive to changes in the structure of forests and which prey on species which may in turn be sensitive to changes in the condition of the forest;
- Aquatic invertebrates and vertebrates such as Alpine Tree Frog which may provide an indication of trends in water quality and in turn, the health of aquatic ecosystems;
- Arboreal mammals such as Greater Gliders or Yellow-bellied Gliders which are relatively easy to survey and which are sensitive to changes such as a declining abundance of hollow-bearing trees;
- Diurnal birds that may be already in decline although not yet to the level of being classified as threatened (such as Chestnut-rumped Heath Wren, Pink Robin, Speckled Warbler) and are dependent on a variety of habitat elements in the forest;
- Nectarivorous birds such as Swift Parrot that may be dependent on the flowering capacity of large old trees;
- A variety of plant species of different life histories;
- Fire and timber harvesting history to ensure the extent and distribution of these processes are maintained within planned parameters;
- Pest and weed populations which may be either a symptom or cause of changes in the condition of the forest, are important but need to be assessed in the context of impact on biodiversity assets.

This list needs to be refined and confirmed early in the implementation phase of this Plan in consultation with other land managers, scientists and stakeholders.

In addition to the general indicators of forest biodiversity, specific monitoring of populations of threatened species needs to be undertaken to ensure early detection of population trends.

The Victorian Biodiversity Strategy establishes a requirement for monitoring on a bioregional scale. NRE has established a number of Bioregional Networks, which have the task of reporting on the condition of biodiversity assets in each bioregion across all land tenures. Reporting on forest condition will be conducted in this framework.

ACTION

In conjunction with other public land managers and private forest owners, establish monitoring programs at a bioregional scale to determine the success of the biodiversity management strategies established in this Plan.

Chapter 4
TIMBER PRODUCTION

Clearing and timber utilisation from the forests of the North East began in the mid-nineteenth century. Graziers and selectors initially felled vast quantities of bush timber to open up the land for grazing, and during the gold rush of the 1850s, the demand for timber increased to supply shafts and pit props. Durable species were utilised to produce railway sleepers and piles for piers and bridges.

Currently, State forest in the North East (Benalla–Mansfield and Wangaratta Forest Management Areas (FMA) and the majority of the Wodonga FMA) contributes about 8% of Victoria's annual production of hardwood sawlogs and 1.3% of residual logs (VicRFASC 1998a). Residual logs (which include pulpwood logs) and firewood are produced as by-products of sawlog harvesting and regrowth management operations.

In 1996–97, nine hardwood sawmills received sawlogs from native forests in the region and a further four sawmills received residual logs only. In addition, three processors received residual logs from the region or sawmill residues from sawmills utilising logs from the North East (VicRFASC 1998a). A large proportion of sawlogs produce high quality, kiln dried timbers.

The sawmilling and residual log processing based industries using wood sourced from the North East presently account for an estimated 279 direct wood based industry jobs (located within and outside the North East planning area). These have an estimated gross value of production of $20.3 million. The total level of employment attributable to hardwood resources sourced from the North East region from logging and haulage, sawmilling and residual log processing industries is therefore estimated to contribute around 626 jobs to the Victorian economy (VicRFASC 1998a). It is estimated that the value of turnover from the sawmilling and residual log processing industries receiving hardwood resources from the North East contribute around $33 million and $7 million respectively (VicRFASC 1998a). On this basis, it is apparent that the native wood based industries are an important part of the local economy of the North East.

For more information regarding the structure and extent of the North East timber industry, refer to the North East Comprehensive Regional Assessment document produced for the North East Regional Forest Agreement (RFA) (VicRFASC 1998a).

Timber production in the North East is influenced by a number of factors, including the following:

- fires in 1926 and 1939 created large areas of even-aged Alpine Ash regrowth in the Wodonga and Benalla–Mansfield FMAs that is an important timber resource now and for the future;
- selective harvesting practised in many of the forested areas located close to settlements prior to the 1960s created a mosaic where small patches of regrowth occur amongst older stands leading to reduced productivity and difficulties in harvesting the mature trees without damaging regrowth;
- commercially productive forests are widely dispersed across the North East forests. Approximately 62% of the State forest area is considered unproductive under existing market conditions due to accessability and product distribution;
- insufficient markets for low grade wood currently limit the range of silvicultural options available;
- proclamation of the *Forests (Timber Harvesting) Act* 1990 related the permitted level of sawlog harvesting from each Forest Management Area to the sustainable yield of those areas; and
- the widely dispersed nature of the timber resource and sawmill locations across the North East, in addition to other factors, has contributed to some inefficiencies in harvesting operations and product segregation.

The National Forest Policy Statement (Commonwealth of Australia 1992a), to which both Commonwealth and Victorian governments are signatories, sets out a strategy for ecologically sustainable management of Australia's forests. The Statement acknowledges the contribution that forest-based industries make to the national economy and regional and local employment. The focus of hardwood production from Victoria's State forests is to supply a sawlog driven industry that produces value-added wood products.

NRE has adopted a fully commercial approach to its management of production forest. Current policies give strong support to value-adding utilisation of timber resources. Together, these are major influences on this Plan. Implementation of these policies will ensure resource security and provide for development and growth of a sustainable timber industry.

Aims

- ***To provide a long-term sustainable supply of hardwood sawlogs to the timber industry.***
- ***Meet sawlog and residual log licence and legislated commitments.***
- ***Maximise utilisation of sawlogs from timber-harvesting operations while continuing to provide other timber products.***

4.1 HARDWOOD TIMBER SUPPLY

A long-term goal of forest management is to sustainably manage all forest values, including the supply of harwood sawlog. Hardwood logs are harvested from the net productive area of the General Management Zone (GMZ) and Special Management Zone (SMZ) (described in Chapter 2 – *Forest Management Zones*). Optimisation of supplies from the net productive area is achieved by:

- a balanced choice of land management options;
- adopting best-practice harvesting and regeneration systems;
- ensuring adequate regeneration of harvested areas;
- adopting silvicultural treatments (such as thinning) to enhance sawlog yield within economic and environmental constraints; and
- protecting forests from damage through factors such as wildfire, disease and insect attack.

Logs harvested from the North East are utilised in several ways. These can include:

- high grade sawlogs which are processed into kiln-dried and appearance grade products used by the furniture, cabinet-making and building industries;
- lower grade sawlogs which are chiefly sawn into material for house framing and other general construction purposes; and
- residual logs which are produced as a by-product of sawlog harvesting operations and include those low-quality logs suitable for conversion into woodchips or sawn products, but which do not form part of the sawlog sustainable yield. They are utilised for a variety of products such as pallets and fence palings, where short lengths can be used and the appearance and strength of timber is less important. Residual logs may also be used to produce woodchips for domestic paper manufacturing or exported for the subsequent manufacture of high quality, paper products.

Statewide Forest Resource Inventory (SFRI)

In 1994, NRE commenced the Statewide Forest Resource Inventory (SFRI) program which will provide the first comprehensive, standardised statement of the State's native forest resources. The SFRI will be used for strategic planning, forecasting sustainable yield and a range of other applications. The inventory also includes the collection of biodiversity information, such as tree hollow numbers.

The North East component of the SFRI was completed in late 1998. This inventory included all of the forested area on public land in the North East. Information generated from SFRI includes the mapping of the productive forest, estimates of standing volume, and growth and yield data.

From SRFI data the area of productive forest (net productive area) is determined based on species, height and crown cover data. SFRI data has been used in analysing the future availability of sawlogs following the implementation of the zoning scheme established by this Plan.

Net available productive area

The area of productive forest, identified from SFRI data, that is available for sawlog production, once exclusions are made for the *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a), Special Protection Zones (SPZ) and forest of low inherent productivity, is defined as the net available productive area.

The net available productive area in the North East, upon implementation of this Plan, is approximately 12% of the extent of public land and exists within the timber-production sub-zone of the GMZ. Approximately 13 000 ha of the SMZ is estimated to be productive. The extent to which this is available is subject for harvesting depends on the application of the relevant guidelines.

Appendix N provides an area statement by forest management zone and forest type.

Sustainable sawlog supply

Sustainable yield is the forecast rate of harvesting that can be maintained for a given period without impairing the long-term productivity of the land, taking into account the structure and condition of the forest and the diverse range of forest-based activities.

Under the *Forests Act* 1958, sustainable yields are to be reviewed:

- every five years;
- when significant change in the available sawlog resource occurs (e.g. due to wildfire); or
- at any time the Minister considers appropriate.

Sustainable yield rates for the Benalla–Mansfield, Wangaratta and Wodonga FMAs were reviewed in 1996. The report *Review of Sustainable Yield Rates for Hardwood Sawlogs from State forest* (NRE 1997e) describes the review process. Similar reviews will be undertaken during the life of this Plan.

The sustainable yield of sawlogs from each of Victoria's 15 FMAs is listed in Schedule 3 of the *Forests Act* 1958. For the FMAs of the North East (Benalla–Mansfield, Wodonga and Wangaratta FMAs), the combined current sustainable yield rate is 66 500 m^3 of A, B, C and D grade sawlogs per year.

The sustainable yield rate (as determined in 1996) for each FMA is listed in Table 4.1.

Table 4.1 1996 Annual Sustainable Yield Rates for Forest Management Areas in the North East

Forest Management Area	Scheduled sustainable yield rate (m^3) per year[1,2]
Benalla–Mansfield	13 500
Wangaratta	25 000
Wodonga	28 000
Total	**66 500**

Notes:

1. The sustainable yield shown for the Wodonga FMA is for the entire FMA. Only part of the Wodonga FMA is included in the North East planning area; eleven Forest Blocks within the Wodonga FMA are in the Gippsland RFA Region and will included in analyses for the Gippsland Forest Management Plan.
2. The scheduled sustainable yield rate includes A, B, C and D grade sawlogs.

An interim forecast of D+ sawlog availability was made during the RFA process, using the Integrated Forest Planning System (IFPS), SFRI data and the zoning scheme defined in the RFA. The forecast was based on a broad aggregation of SFRI data and includes volume and area-based adjustments to allow for factors that cannot readily be modelled at this aggregated level.

Based on the timber resource analyses conducted during the RFA process, the North East planning area (comprising the Benalla–Mansfield and Wangaratta FMAs and part of the Wodonga FMA) is expected to provide (as a minimum) the current level of supply of D+ sawlogs (68 000 m^3 per annum) for the next twenty years. However, the RFA and this Plan recognise that timber supply level in Victoria are subject to change based on periodic review of sustainable yield.

The next review of sustainable yield rates will be based on resource information from the SFRI and the use of the IFPS. This review is scheduled for completion in Benalla–Mansfield FMA by 30 June 2001 and the Wangaratta and Wodonga FMAs by 31 December 2001 in accordance with the amended schedule included in the Gippsland and West Victoria RFAs completed on 31st March 2000.

In addition, the RFA requires NRE to manage the forest estate in the North East to at least maintain its timber production capacity in terms of volume, species and quality.

ACTION

Formally review sustainable yield for the forests of the North East, consistent with the schedule specified within the Regional Forest Agreement.

Residual logs

Wood made available to industry as residual logs comes from trees (or parts of trees) remaining after the sawlogs have been removed and which are either too small or too defective to meet current sawlog specifications. Industry demand for this material varies with market conditions. At present, licences for residual logs in the North East total 30 000 m^3 but harvest rates have been lower than this.

Generally, residual logs purchased by sawmills are sawn to produce low-quality timber products such as pallets and fence palings. Residual logs and sawmill residues are also used in production of woodchips for export and production of pulp, which is further processed into various types of paper.

Currently, the log volume of residual logs harvested in the North East amounts to a small proportion of the total low grade material produced during sawlog harvesting operations. The remainder of this material is left on site where it is usually burnt during site preparation or regeneration operations.

The development of a strong market for residual logs can be an important aid to silvicultural activities. It can enable greater utilisation and cost-effective regeneration of stands, particularly those that have been damaged or degraded by fire or past utilisation practices and which, as a result, carry a large proportion of lower-grade log products. Removal of residual wood from the ground after a thinning operation allows subsequent operations to be carried out more efficiently.

ACTIONS

Encourage the development of new value-added markets for residual logs.

Where residual logs are harvested, direct residual log licensees to those coupes in which the removal of residual material will confer the maximum silvicultural advantage, subject to consideration of haulage distance.

4.2 HARVESTING AND REGENERATION SYSTEMS

Successful harvesting and regeneration systems are those that:

- ensure adequate regeneration of the correct species mix;
- obtain good growth;
- maximise sawlog yield;
- minimise environmental impact;
- incorporate social and economic considerations; and
- protect regeneration from significant levels of damage from factors such as browsing and disease.

A number of harvesting and regeneration systems are used within the forests of the North East. For each harvesting operation, the type of system used is determined by the characteristics of the stand. These can include:

- clear felling systems, which are often used in even-aged Ash forests;
- seed tree systems, which are generally used for the higher productivity mixed species stands where there is sufficient seed in retained trees; and
- selection harvesting methods, which are usually applied in lower productivity mixed species forests.

Guiding principles for the application of harvesting and regeneration systems in State forest are set out in the *Code*. Operational procedures and standards are provided in the 'Native Forest Silviculture Guidelines' (CNR 1993a; CNR 1993d; CNR 1994b; CNR 1994c; CNR 1995d; NRE 1997b; NRE 1997h; NRE 1998d). Detailed prescriptions for mixed species silviculture are documented in the 'Silviculture Guideline for the Mixed Species Forests of the North East Area' (Ryan 1997). Current and potentially available silvicultural treatments are listed in Table 4.2.

Table 4.2 Current and potentially available silvicultural treatments for the State forests of the North East

Forest type	Silvicultural treatments currently used	Silvicultural treatments potentially available
Ash Species	Clear felling	Retained overwood[1]
	Seed tree	Shelterwood[2]
	Reforestation	Early spacing
		Thinning
Mixed Species	Clear felling	Early spacing
	Seed tree	Reforestation
	Selection	Group selection
		Shelterwood
		Thinning
		Overwood removal

Notes:
1. Availability is subject to operational development to address costs, productivity and retained tree survival.
2. Availability is subject to continued research and development to address safety, costs and productivity.

Adequate regeneration of the required type is fundamental to sustainable timber production. Analysis of regeneration survey data shows that almost all (approximately 99%) of the area harvested in the North East between 1989 and 1993 using even-aged silviculture were successfully regenerated (NRE 1996c). Those coupes considered to be inadequately regenerated received remedial treatment. The amount and quality of ground suitable for seeds to germinate and develop (the seedbed) is a critical factor in whether regeneration operations are successful. Common methods of site preparation for regeneration such as the use of fire or mechanical disturbance, maximise potential for regeneration success by ensuring seedbed conditions are suitable for seedling germination and growth.

Failure to apply sound harvesting and regeneration practices leads to a decline in forest productivity. Some forest areas in the North East, because of their history of wildfire have become degraded over time. Poor harvesting and regeneration methods in the past, have also degraded some forest areas and require specific management action to realise their potential for timber production (Dore 1995). For example in some cases, the original species composition has been altered by the selective removal of preferred species without adequate regeneration, and selective harvesting of better quality trees has left a proportion of defective trees.

Application of seed tree, clear felling, and selection systems

Seed tree

This system involves the retention of about 5–9 well-spaced trees of good form per hectare, which carry capsule crops for the supply of seed. A regeneration burn is generally used to prepare the seedbed and induce seed fall from the retained trees. The retained seed trees (in excess of habitat requirements) may be felled or poisoned following successful regeneration establishment. Even-aged regeneration is achieved. This silvicultural system is used in years of good seed crops and where suitable seed trees are distributed throughout the coupe. It is most commonly applied in high quality mixed species stands.

Clear felling

This system involves the removal of all trees within the coupe, except those retained for environmental purposes. Seedbeds are then prepared by either high intensity burns or mechanical disturbance. Regeneration is achieved by the application of seed of a suitable provenance by aerial or hand sowing, or by planting seedlings. Even-aged regeneration results from this silvicultural method. Clear felling is most commonly practised in Ash forests and may also be used in the high quality even-aged mixed species forests.

Selection

This system is applied to uneven-aged mixed species forests where there is sufficient advanced regrowth and a current economic harvest of timber. The silvicultural system is well suited to the drier mixed species forests. Regeneration occurs through lignotubers, coppice or seedlings. Generally, the mechanical disturbance created during harvesting provides a suitable seedbed for regeneration in the patches, which are not stocked by advanced regrowth.

Seedbed preparation

The distribution and amount of receptive seedbed across a coupe, the seed supply and the level of competition from other species strongly influence whether regeneration will establish successfully. A receptive seedbed can comprise either mechanically disturbed soil (such as that provided by harvesting equipment during logging) or an ash bed (produced by burning the heads of trees and waste wood remaining after harvesting). Re-treatment of inadequately stocked regeneration areas may involve mechanical disturbance of the soil surface (through ripping or root-raking) to create the required seedbed.

Burning provides a good distribution of receptive seedbed across the coupe. It significantly reduces fire hazards, reduces the competition between eucalypt seedlings and other plants remaining in the coupe, and is a cheap and efficient means of providing a suitable seedbed. However, it may result in higher levels of nutrient loss from the site and damage to retained trees, compared to mechanical disturbance. Mechanical disturbance, however, can damage the understorey and may lead to poor regeneration of some species such as tree ferns. The use of understorey islands in harvesting coupes where mechanical disturbance is excluded, may assist in improving the regeneration of these species (see NRE 1998f).

Management Guideline

Choice and application of harvesting and regeneration systems

CHOICE

The system (selection, clear fell, seed tree) or combination of systems chosen for a particular coupe should take account of the characteristics of the forest stand and of other values in the area.

APPLICATION

Use of the **selection system** for sawlog production should be considered in mixed species forests where:

- the forest stand is uneven-aged;
- the stand includes a significant proportion of advanced regrowth that is to be retained;
- selection will improve the growth rates of the retained trees; and
- a more intensive harvesting system would produce a level of residue that may restrict regeneration.

Selection harvesting systems may also be considered in SMZ where the purpose of management of the zone:

- requires a method of harvesting that minimises landscape impacts;
- achieves fauna conservation objectives; and
- where lower regeneration levels can be justified by the protection of other values in the zone.

Seed tree systems should be considered where:

- the forest stand is generally mature and even-aged;

continued next page

Management Guideline – Choice and application of harvesting and regeneration systems - continued

- trees carrying adequate seed store in their crowns can be retained at the required spacing; and
- climatic conditions are harsh and seedfall distributed over a longer period of time may increase regeneration success in preference to systems such as clear felling where there is one application of seed.

The **clear felling** system should be considered for stands that:

- are predominantly even-aged with little or no regrowth present;
- have a dense understorey or ground cover that can inhibit regeneration;
- support relatively high standing volumes of sawlog; and
- can be regenerated using seed (or seedlings) obtained from the locality.

Regeneration operations, particularly seedbed preparation, should take advantage of the peak in natural seed fall from retained trees.

The intensity of regeneration burns should be managed to contribute to the establishment of regeneration while minimising damage to retained trees.

Mechanical disturbance methods for seedbed preparation should be considered where regeneration burns are not proposed. Mechanical disturbance will be excluded from understorey islands, where these are required.

Post harvest regeneration monitoring should be conducted on all coupes where regeneration is an objective of the silvicultural system. Where monitoring indicates that regeneration is unsatisfactory, sites should be retreated to ensure adequate regeneration.

ACTIONS

Apply appropriate harvesting and regeneration systems in accordance with the Code, Guideline for the Choice and Application of Harvesting and Regeneration Systems, Choice of Silvicultural Treatment – Mixed Species, North East Victoria (NRE 1997g) and Native Forest Silviculture Guidelines.

Modify harvesting and regeneration systems:

- ***where values other than timber production (such as landscape values) must be maintained; or***
- ***where the silvicultural characteristics of the stand allow for the economic application of alternative techniques and permit the establishment and growth of regeneration.***

Continue to review harvesting and regeneration systems and revise field practices based on research findings.

Low-volume forest management

Forest stands with low volumes of material suitable for sawlog production are widespread across the North East. Much of the mixed species forests on the lower foothills are within this category. In some cases, a combination of fire and limited control over selective harvesting in the past has further reduced timber values and may have altered their species composition.

These forests are not usually harvested for the commercial production of sawlogs, but some of the more accessible areas are utilised for minor forest products such as firewood and fencing material. Providing this harvesting is carefully managed, it can help to restore the environmental and silvicultural values of these stands.

Foothill forests containing more durable species such as Red Box, White Box and Long-leaf Box have the potential to produce low but continuing volumes of specialist hardwood timbers, however, the area available for harvesting these species is limited.

ACTIONS

Restore and maintain the productivity of low-volume forests through harvesting and regeneration systems which ensure adequate regeneration and stocking.

Encourage the best use of the timber harvested by strict application of utilisation standards that ensure logs of large dimensions and good form are not used for low-value products.

Forest rehabilitation

Forests requiring rehabilitation are those with potential to produce commercial volumes of timber, but which currently carry low volumes of sawlogs generally as a result of past selective felling practices or wildfire damage. Silvicultural techniques can be used to improve the productivity and restore areas of these forests.

ACTION

Identify degraded forest stands and where feasible, restore their productivity by appropriate silvicultural techniques to ensure regeneration.

Salvage

Events such as wildfire, wind storms, disease or extensive insect attack may lead to substantial areas of forest consisting of dead or damaged trees. Where these areas occur within the GMZ and SMZ, salvage operations may be implemented to recover valuable timber resources. Generally, wildfire events in SPZ are unlikely to permanently destroy the values of the SPZ and salvage would not be proposed.

Management Guideline

Salvage harvesting and regeneration

Areas of forest within GMZ subject to extensive damage should be considered for salvage harvesting following the preparation of a salvage plan. The salvage plan must be prepared in accordance with the *Code* and include:

- flora, fauna, cultural and water quality and quantity values;
- access;
- priorities for harvesting the resource and the volume of timber expected to be recovered; and
- rehabilitation of the area following the salvage operation including regeneration.

Areas of SPZ and SMZ may be available for salvage harvesting where the:

- impact of the destructive event has led to the SPZ or SMZ to no longer contain the value for which the zone was identified;
- values for which the area of SPZ or SMZ were identified may be better represented by reserving other areas of forest in SPZ or SMZ; and
- values of the SPZ or SMZ are primarily cultural and historic, and salvage harvesting will not disturb the historic fabric of the site.

Where SPZ is proposed for salvage harvesting, proposed amendments to the zoning scheme should ensure that there is no net deterioration in the level of protection of values in the SPZ, nor any long-term reduction in timber production capacity. Replacement areas for SPZ should be identified prior to the salvage operation commencing.

Sustainable yield forecasts may require review following a major salvage operation.

ACTION

Prepare salvage harvesting and regeneration programs as needed in accordance with the* Code*, Wood Utilisation Planning guidelines and the above guideline.

4.3 REGROWTH MANAGEMENT

In order to improve or maximise future sawlog production from young regrowth forests, intensive management techniques such as thinning can be used. Thinning treatments involve the removal of trees that have less potential to produce large sawlogs than the trees selected to be retained. Thinning treatments can be pre-commercial with no merchantable timber produced, or commercial where small sawlogs and low-grade logs are produced.

Thinning operations are designed to achieve stocking levels that improve the growth of the remaining trees to produce sawlog quality logs. Consequently, thinning is usually focused on regrowth stands that have the potential for high productivity. These operations aim to increase the proportion of high grade (currently A or B grade) sawlogs in the forest to facilitate value-adding by the timber industry.

Current silvicultural practices in the North East do not include either commercial or pre-commercial thinning in either Ash or Mixed species regrowth. However, there may be opportunities to do so in the future following identification of suitable areas and the development of markets.

SFRI has identified areas of regrowth forest within North East State forest. However, prior to the development of a market for regrowth timber products, the regrowth stands would require further assessment to determine the extent of the resource and operational suitability.

Management Guideline
Regrowth

Commercial thinning treatment should be directed to stands that:

- maximise the growth of sawlogs (younger stands should be preferred over older stands, for instance);
- allow operations which will minimise damage to retained trees;
- are close to markets for other forest produce;
- minimise timber harvesting costs; and
- in mixed species, meet the thinning criteria as described in *Thinning of Mixed Species Regrowth* (NRE 1997h).
- in ash forests, meet the criteria as described in *Guidelines and Prescriptions for Ash Thinning Operations* (CNR 1992b).

Pre-commercial thinning should be targeted to stands in the medium to high productivity forest areas to maximise the future growth rates of sawlogs.

Regrowth management operations should be conducted to ensure that damage to retained trees is kept within acceptable limits. Non eucalypt understorey species should be retained, where practicable, unless they contribute a high proportion of the stand stocking and are considered to have a significant competitive effect.

Regrowth thinning operations should be dispersed across the forest, as far as practicable, to reduce the concentration of areas with high fire hazard and to protect against the loss of thinned areas from a single wildfire.

Thinning areas should be included in the wood utilisation planning process.

ACTIONS

Identify areas suitable for commercial thinning and encourage commercial thinning operations where markets develop.

As the basis for operational planning for any proposed thinning program (both commercial and pre-commercial), assess regrowth areas to determine the location and density of trees in moderate to high productivity sites.

Overwood removal

Suppression of regeneration and regrowth by trees remaining on a coupe after harvesting (overwood) is well documented (Bassett and White in press; Incoll 1979). The level of reduction in the sawlog productive capacity of a forest stand is related to the level of overwood within it. Operations involving the selective removal of mature trees from established stands of regrowth are aimed at releasing regrowth from competition. The operation does not remove trees required by prescription for habitat purposes.

Modern techniques of herbicide stem injection have largely replaced ring-barking, bringing efficiency and occupational safety benefits in situations where overwood trees are not harvested (NRE 1999b).

The general market for low quality residual logs is currently insufficient to allow for widespread use of overwood removal to improve stand productivity. With expansion of this sector of the residual log market, silvicultural treatments, such as overwood removal could be used to improve the productivity of regrowth stands.

Management Guideline
Overwood

Subject to favourable economic analysis, suppressive overwood, including seed trees, should be treated to reduce competition provided:

- it is not required for other management purposes (such as habitat trees);
- the basal area of overwood is acting to suppress the regrowth stand beneath;
- the forest is capable of producing commercial quantities of sawlogs; and
- techniques recommended in *Treatment of Un-merchantable Trees* (NRE 1999b) are adopted.

ACTIONS

Conduct overwood removal operations consistent with the guideline above.

Establish a program of commercial overwood removal consistent with the guideline above where markets exist.

4.4 OTHER TIMBER PRODUCTS

The State forests of the North East are close to large rural centres, numerous small towns and rural communities. This creates demand for a range of timber products other than sawlogs or residual logs, including firewood and farm timbers (post and poles).

Firewood

Most areas of State forest in the North East produce some firewood and some of this is able to be supplied as a by-product from sawlog harvesting operations. Most firewood collection is for private use. In 1996/97, the volume of firewood sold from the North East (to both commercial and non-commercial cutters) totalled more than 11 000 m^3. Commercial cutters produced less than 100 m^3 of firewood. It is intended to establish agencies (such as service stations and milkbars) in various towns throughout the North East that will be authorised to sell firewood permits (in 1 m^3 lots). These agencies will operate outside normal NRE business hours and should assist in reducing the illegal removal of firewood by increasing the opportunity for non-commercial cutters to purchase permits.

Under natural conditions in a forest, there is always a certain amount of woody debris on the ground (fallen trees and branch-wood) and a number of large dead standing trees that are components of faunal habitat. Removal of this material, through firewood harvesting, can reduce habitat values. Dispersed harvesting of naturally-fallen timber is unlikely to remove significant amounts of habitat. However, caution must be exercised in areas close to towns, where demand for firewood is high, because if other sources of wood (such as logging coupes) are not available, almost all naturally-fallen timber may be removed.

It is intended to encourage commercial harvesting of firewood in the North East. This approach will enable greater regulation and control over firewood activities, allow firewood to be incorporated into other timber production operations and provide firewood in quantities to meet the demands of local and more distant markets.

Consideration was given to the preference of domestic firewood cutters to obtain material close to towns, however, the zoning scheme introduces SPZs within which there are a number of current firewood collection areas. Firewood collection will no longer be permitted in these SPZs. The public will be made aware of these changed arrangements, particularly the State forests close to Beechworth, and the identification of alternative areas. Firewood permits will also specify the locations where firewood can be obtained.

A Firewood Strategy for Victoria is currently being developed to ensure an ecologically sustainable supply of firewood from public and private land, and to minimise the impact on important flora and fauna communities.

Management Guideline
Firewood activities

Harvesting of firewood should be targeted at those areas where it has the greatest potential to increase sawlog productivity or assist forest management activities.

Commercial firewood cutting will be managed in accordance with the *Code* and Wood Utilisation Planning guidelines.

Agencies permitted to sell firewood permits should be established in towns in close proximity to State forest.

Maps of current domestic firewood areas should be available at relevant NRE offices and agencies in North East. The location of agencies should be advertised, periodically each year, in local newspapers.

Firewood permits should specify the location where collection may occur.

Wherever possible, firewood cutters should be directed to collect wood from areas where other harvesting activities have been undertaken and should not be permitted to harvest dead standing trees or collect naturally-fallen wood elsewhere.

Enforcement patrols should be undertaken, especially during peak collection times.

ACTIONS

Provide firewood from timber harvesting or silvicultural operations within the GMZ and SMZ, where it is consistent with management aims.

Provide information to the public regarding the exclusion of firewood collection from the SPZs identified in this Plan and the specific areas available for firewood collection with a permit.

Encourage commercial firewood harvesting operations.

Arrange for the issue of domestic firewood permits through local retail outlets.

Include areas designated for firewood harvesting in the Wood Utilisation Plan (WUP).

Posts and poles

Small quantities of posts and poles for fencing are produced from the forests of the North East. The foothill forests adjacent to private land are the preferred location for harvesting of posts and poles.

ACTIONS

Locate post and pole harvesting operations in areas which will improve the potential for sawlog production.

Integrate post and pole production with other forest operations where possible.

Include areas designated for post and pole harvesting on the WUP.

Minor forest produce

There is a small demand for minor forest products such as eucalypt seed, understorey species, cut flowers, wood-chop logs, stakes and specialty timbers.

Seed, in excess of NRE requirements for regeneration, may be sold under the *Forests Act* 1958 to private collectors for commercial and non-commercial purposes. The *Flora and Fauna Guarantee Act* 1988 provides for a permit process to control seed collection from protected species. Other minor forest produce is sold by licence.

Specialty timbers comprise:

- non-eucalypt tree species, including Blackwood (*Acacia melanoxylon*), Silver Wattle (*A. dealbata*);
- eucalypt species such as Red Stringybark (*Eucalyptus macroryncha*); and
- feature material such as burls, fiddle-back and birds-eye grain, which can occur in eucalypts.

Specialty timbers in small quantities occasionally become available during sawlog harvesting and road construction. Timber resource information for the North East is not precise enough to determine sustainable yields for specialty timbers. It is therefore prudent to consider them as a by-product of sawlog harvesting and to issue short-term licences when the resource becomes available.

ACTIONS

Consider NRE seed requirements prior to the issue of any seed collection licences.

Direct, as far as practicable, the collection of seed and other minor forest products to those areas affected by timber harvesting, silvicultural or road-construction operations. For other areas, activities should be conducted in a manner that is compatible with protection of natural values.

Sell by tender or by licence for small lots, those specialty timbers produced during normal management activities.

Chapter 5
STREAMS AND CATCHMENTS

The forested upper slopes of the Great Dividing Range are an important source of water for hydro-electricity, irrigation and domestic purposes used within and outside the North East. The North East includes the Lake Eildon, Dartmouth and Hume water storages, which have a combined capacity of over 10 million megalitres of water. Water from the North East is used by over 30 towns in the North East including Wodonga, Wangaratta and Benalla and to irrigate pasture, orchards and crops which occur across the northern Victoria. In addition, water sourced in the North East is used for domestic and irrigation purposes by communities along the Murray River to Adelaide.

The Goulburn Broken and North East Catchment Management Authorities established under the *Catchment and Land Protection Act* 1994 are responsible for the preparation of regional catchment strategies (GBCALP 1997; NECALP 1997). These identify objectives and priorities for the quality of land and water resources. The strategies within this Plan were developed in accordance with those strategies and in consultation with these Catchment Management Authorities.

Goulburn–Murray Water manages Lake Hume, Lake Eildon and Dartmouth Dam and water diversions from streams for irrigation and stock and domestic purposes, as well as to the Goulburn Valley and North East Water Authorities.

The Goulburn Valley and North East Water Authorities provide reticulated water to urban and rural township consumers from numerous catchments within the North East, and apply varying levels of treatment. The types of treatment depend on the nature of catchments and the requirements of communities being supplied. Any significant reduction in water quality could add to the cost of water supply through necessitating either higher levels of treatment or the introduction of treatment where none is currently necessary. Accordingly, maintaining current water quality standards is a high priority for forest management in the North East.

The State Environment Protection Policy (Waters of Victoria) (VicEPA 1998), which came into effect on 15 March 1988, applies to all surface waters within State forests. Data on surface water quality was compiled as part of the Water Quality Strategies for the Ovens, Kiewa and Upper Murray Basins. This data was from the Victoria Water Quality Monitoring Network and indicates that surface water in the forested parts of the North East catchments is good (Hunter 1996). The Goulburn–Broken Water Quality Strategy was completed in 1996 and provides data on surface water quality for the Goulburn and Broken Rivers.

Generally, monitoring indicates water quality is suitable for use without treatment, however, many towns treat their water supply in some way. In-stream declines in water quality can usually be attributed to agricultural or urban land uses on freehold land downstream of the forested upper catchments. The water quality of urban supplies drawn from catchments with mixed land use is influenced by all land uses in the catchment.

Catchment yield is an important consideration in water supply. The *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a) requires that appropriate rotation lengths and silvicultural techniques are used so that water yield may be maintained at acceptable levels. An area of vigorously growing young forest will use more water than a mature forest of the same area. Water yield depressions may occur in forested catchments where Ash eucalypt species predominate and a high proportion of regrowth forest exists. The sawlog productive areas of State forest in the North East comprise about 22% of the total State forest area and 12% of the area of public land. However in small catchments which contain a high proportion of sawlog productive forest, care is needed to ensure that water yield depressions are minimised.

Maintaining water quality and yield are important issues for environmental reasons as well as for domestic water supply. Many native aquatic fauna are sensitive to alterations in water quality. The relatively

undisturbed stream environments in forests are important for these flora and fauna species and communities. Maintaining water quality is therefore an important factor in maintaining forest biodiversity. Management actions for specific species, such as the Spotted Tree Frog (*Litoria spenceri*) and retention of linear reserves along major rivers are detailed in Chapter 3 – *Biodiversity Conservation*.

The Land Conservation Council (LCC) (LCC 1991a) undertook a statewide investigation of streams and catchments across Victoria to identify and make management recommendations for Heritage Rivers, Essentially Natural Catchments (Natural Catchment Areas) and Representative Rivers. Within the North East, it recognised the special value of one river and seven catchments in State forest. Subsequent to the LCC investigation, the *Heritage Rivers Act* was enacted in 1992. Management of Heritage River Areas and Natural Catchment Areas is in accordance with the *Heritage Rivers Act* 1992. Draft management plans (NRE 1997c) have been prepared for these areas and are currently being finalised.

Although the majority of water used for domestic and irrigation purposes is obtained from surface water, groundwater is used occasionally as a secondary source. There are two important Groundwater Management Areas (GMA), stretching down along the valleys from Harrietville and Mount Beauty, parts of which occur in State forest. The GMAs are primarily recharged by rainfall on the surface. As there is a small proportion of productive State forest in recharge areas, it is unlikely that State forest management activities would adversely affect groundwater values in the GMAs.

Aims

Ensure that in State forest:

- ***in-stream water quality meets State Environment Protection Policy standards for current and likely future urban and rural water supply uses;***
- ***in-stream water quality is suitable for naturally-occurring populations of aquatic flora and fauna;***
- ***water yield is not adversely affected by management activities; and***
- ***natural values of streams are maintained.***

5.1 CODE OF FOREST PRACTICES REQUIREMENTS

The *Code* sets goals, guidelines and some minimum statewide prescriptions for environmental protection. Harvesting and regeneration prescriptions are developed based on the *Code* and enhanced where required by regional conditions. The continued application of the *Code* and harvesting prescriptions provides an appropriate level of water quality protection in the General Management Zone (GMZ).

The *Code* contains a number of measures aimed at protection of water quality and aquatic habitat. These include:

- the retention of a buffer of riparian and other vegetation within at least 20 m of permanent streams (streamside reserve). This buffer may be increased to either 30 m or 40 m, according to the slope, soil permeability, potential for erosion and overland flow;
- the retention of at least 20 m of riparian and other vegetation from permanent springs, swampy ground and bodies of standing water. This buffer may be increased to either 30 m or 40 m, according to the soil permeability, potential for erosion and overland flow; and
- the retention of a filter strip at least 10 m wide on either side of temporary streams and drainage lines.

Further, the *Code* requires timber harvesting and carting to be suspended during periods of wet weather, and the application of a general maximum slope limit of 30° for harvesting operations. Other *Code* requirements addressing road and track design and maintenance standards and the siting and management of log landings and log dumps, also help to protect water quality in forest catchments.

The *Code* requirements may be extended (in favour of increased protection for the environment) through harvesting prescriptions or through the judgement of NRE Forest Officers while developing coupe plans. Management prescriptions for harvesting and regeneration operations have been developed for the North East and Benalla/Mansfield FMAs (NRE 1997d). These prescriptions and the different buffers based on stream characteristics have implications for their field application. Operational decisions about the location and dimensions of buffers are an important part of achieving water quality and habitat protection objectives. NRE has recently completed field guides to assist in the delineation of harvesting boundaries based on slope and soil characteristics.

ACTIONS

Review and, if necessary, modify the North East and Benalla/Mansfield Forest Management Areas Management Prescriptions for Harvesting and Regeneration to ensure they conform with this Plan.

***Continue to apply the North East and Benalla–Mansfield Forest Management Areas Management Prescriptions for Harvesting and Regeneration, based on the requirements established by the* Code.**

Regrowth management

If a significant proportion of a catchment is harvested over a relatively short period (greater than 20% to 30%), detectable changes to the seasonal pattern of runoff may result (O'Shaughnessy and Jaysuriaya 1991). This, in combination with a small water supply storage, may reduce the volume of water that can be harvested for reticulation. The action below is intended to limit the proportion of young regrowth in catchments and aims to maintain near-normal patterns of seasonal yield.

In determining the extent to which the proportion of regrowth needs to be limited to minimise impacts on water yield, consideration will be given to the current degree of utilisation of water resources in the catchment and current water yields (to be determined in consultation with the relevant water authority(s)). Consideration will also be given to the hydrological impacts of private land management in the catchment. The limits to both the proportion and age of regrowth will be refined, as more information becomes available from hydrological research in mixed species forests.

Where the proportion of regrowth is already such that impacts on water yield may occur as the regrowth ages, no further clearfell or seed tree harvesting will occur until the stands in the catchment mature to the point where potential yield impacts will remain within acceptable limits.

ACTION

Schedule timber harvesting operations in State forest to limit the proportion of regrowth in order to minimise impacts on water yield in water supply catchments.

5.2 HERITAGE RIVERS, NATURAL CATCHMENT AREAS AND REPRESENTATIVE RIVERS

In 1991, the LCC made recommendations on the management of rivers and streams within Victoria. Three main land-use categories were identified:

Heritage River Areas. These areas contain a number of outstanding scenic, recreation, cultural or nature conservation values. The Heritage River Area in State forest in the North East protects part of the Howqua River.

Natural Catchment Areas. These catchments are considered to be in an essentially natural condition and should be managed to protect their condition. Natural Catchments in the North East that include State forest are Devils Creek (Middle Branch), Yarrabulla Creek, Long Jack Creek, Mount Tabor Creek, Banimboola Creek and Williams Creek.

Representative Rivers. These rivers represent a distinctive river-catchment type. The Representative Rivers, which flow through State forest in the North East, are the Upper Big River (in the vicinity of Mount Bogong) and Snowy Creek. NRE manages public land adjacent to these rivers consistent with the recommendations of the LCC report.

NRE has prepared draft management plans for Heritage River Areas and Natural Catchment Areas (NRE 1997c) in accordance with the *Heritage Rivers Act* 1992 and recommendations of the LCC (LCC 1991a). These are currently being finalised.

ACTION

> ***Include the Howqua Heritage River Area and Natural Catchment Areas in the reserve system and manage in accordance with the* Heritage Rivers Act *1992 and approved management plans.***

5.3 WATER SUPPLY CATCHMENT AREAS

Twenty-one areas in State forest in the North East are identified as Special Water Supply Catchment Areas under the *Catchment and Land Protection Act* 1994 (See Appendix O). These were identified because of their significance as water supply catchments. They vary widely in area, in the range of land uses, in soil and landform characteristics and in the uses made of the water harvested from them. For example, Bakers Gully is 825 ha in extent, made up of both State forest and pine plantation and provides water for domestic use in Bright. The Lake Hume (Victorian tributaries) Catchment amounts to approximately one million hectares (DWR 1989) is largely forested, and the water harvested is used for irrigation purposes throughout north eastern Victoria and in New South Wales.

Other important catchment areas for towns may lie within or outside of Special Water Supply Catchment Areas and are not specifically identified. Some of these catchments are made up of significant proportions of State forest and activities must be managed with regard for their values. Because of these wide variations, Special Water Supply Catchment Areas are not suitable as the sole basis for identification of water supply catchments for strategic forest management planning purposes. Other town water supplies not identified as Special Water Supply catchments have been identified as 'Designated Catchments' for the purposes of this Plan. Designated Catchments are discussed in more detail later in this chapter.

Special Area Plans

Special Area Plans, as described in the *Catchment and Land Protection Act* 1994, specify how particular land management issues in the Special Water Supply Area must be addressed. The Minister for Environment and

Conservation and the Department of Natural Resources and Environment must have regard to any Special Area Plan applying to land under their control.

Special Area Plans have been made for the Lake Hume, Ryans Creek, Upper Goulburn (Upper Delatite) and part of the Upper Kiewa (East Kiewa U2) Special Water Supply Catchment Areas in the North East. The format and content of these plans vary. Table 5.1 provides a summary of actions recommended in the Special Area Plans. The Lake Hume Catchment requires that forest operations must be conducted under approved management prescriptions. The harvesting operations carried out in accordance with the *Code* satisfy this requirement. The Special Area Plan for Ryans Creek defines three land use categories, that range from no forest operations or earthworks, to areas generally available for forestry operations. The Special Area Plan for part of the Upper Kiewa Special Water Supply Catchment Area identifies two land use categories and makes special provisions for these categories which focus on protection of water courses and the conduct of earthworks.

Table 5.1 Effect of Special Water Supply Catchment Area Plans on State forest management

Catchment	Summary of requirements affecting forest management
Upper Kiewa	Land use category 1 for protection of streams, water courses, reservoirs and domestic water supplies.
	Land use category 2 for protection of water supply but may be used for forestry operations and low-level recreation.
Hume Catchment	Forestry Practices to be carried out under management prescriptions approved by the Authority.
Ryans Creek	Land use category 1 to be protected for streams and watercourses, forest operations to be minimal.
	Land use category 2 where no clearfelling operations permitted, timber utilisation operations permitted only where slopes less than 12° or 20%.
	Land use category 3 where land is generally suitable for timber utilisation.

The management prescriptions for harvesting and regeneration in native forests for the North East and Benalla/Mansfield FMAs currently suspend all harvesting and cartage operations in the following Special Water Supply Catchment Areas:

- Hume Catchment between 1 July and 30 September;
- Upper Goulburn between 1 June and 31 October;
- Ryans Creek between 1 May and 31 October;
- Nillahcootie between 1 June and 31 October; and
- Lake Eildon between 1 June to 31 October.

These suspension periods may be varied when wet conditions commence earlier or later than the standard suspension dates and if wet conditions either cease or continue beyond the dates indicated.

ACTIONS

Ensure that the requirements of Special Water Supply Catchment Area Plans continue to be incorporated into Regional Harvesting Prescriptions, in addition to any soil and water management prescriptions required under the* Code *or elsewhere in this Plan.

Consult the relevant water supply authorities if coupes are proposed for scheduling in Special Water Supply Catchment Areas that are subject to a Special Area Plan.

Continue to suspend winter harvesting operations in accordance with current prescriptions.

5.4 DESIGNATED CATCHMENTS

The basic requirements established by the *Code* provide an appropriate level of security for water quality and yield over the majority of the North East forests. However, for some catchments used for domestic water supply, where treatment is minimal, an additional level of security for is warranted. Catchments where additional security is required are referred to as designated catchments[2] in this Plan. Designated catchments may be a selected Special Water Supply Catchment Area (or sub-catchments within them) or a town water supply area which has additional importance for State forest management.

Designated catchments are those used for domestic water supply purposes and in which water quality or yield may be influenced by State forest management operations. Generally, they contain a high proportion of State forest (greater than 50%), and are either relatively small (less than 15 000 ha) and have domestic water storages, which receive little or no treatment. In many of these catchments, NRE is the single largest land manager.

Seven designated catchments have been identified with a total area of 28 085 ha. The area of State forest amounts to approximately 16 700 ha. Catchments in the North East meeting these criteria are listed in Appendix O and shown on Map 2.

Designated catchments will be included in the Special Management Zone (SMZ). Timber harvesting and other forest uses in designated catchments must be conducted in a way that ensures high levels of security for water yield and quality through the application of special management strategies. The remaining areas of State forest not identified as designated catchments will be managed subject to standard prescriptions and *Code* requirements.

ACTION

Include the designated catchments identified in Appendix O in the SMZ and apply management strategies aimed at enhancing the security of water quality and yield.

Several strategies will be applied to State forest designated catchments to enhance the security of water values. These apply in addition to any standards applying in the GMZ and are summarised below.

[2] The designated catchments as described here should not be confused with the 'designated water supply catchment areas' specified in the National Parks Act 1975 (a term which refers to areas within Kinglake and Yarra Ranges National Parks).

Seasonal suspension of harvesting operations

Rainfall over most of the North East is markedly seasonal with a peak experienced, up to 65%, during the winter months. This peak is weakly expressed at low altitudes and strongly expressed at high altitudes (LCC 1974b). A high proportion of total catchment runoff occurs during this period.

Although the *Code* applies in all cases, application of a winter suspension in designated catchments will further reduce the risk of water quality being degraded by sediment and nutrient-bearing surface runoff.

The seasonal suspension for designated catchments will apply to all harvesting and stand tending operations which involve the use of heavy machinery that cause significant soil disturbance. In all operations and in all seasons, the soil and water quality protection measures of the *Code* will continue to apply as a minimum standard.

ACTION

Apply winter suspensions for logging, road works and other heavy earthworks in accordance with the dates specified in Table 5.2. The period of suspension may be extended in accordance with the onset or continuation of wet weather conditions.

Table 5.2 Winter closures and coupe size limits in designated catchments

Designated Catchment	Winter Closure	Max. coupe size (ha)
Mount Tabor Creek	1 July–30 September	40
Black Dog Creek	1 July–30 September	30
West Kiewa River	1 July–30 September	40
Musk Gully Creek	1 July–30 September	35
Ryans Creek	1 May–31 October	40
Bakers Gully Creek	1 July–30 September	20
Diddah Diddah Creek	1 July–30 September	20

Note: Ryans Creek, Bakers Gully Creek and Diddah Diddah Creek are identified as Special Water Supply Catchment Areas (CaLP Act 1994) and also meet the criteria for Designated Catchments. As such, winter closure periods and coupe size limits have been applied.

Prevention of soil erosion

Mobilisation of soil particles in water erosion processes is related to slope angle and length, the physical and biological characteristics of the soil, the level of soil disturbance and rainfall intensity. Preventing soil disturbance will help to reduce the risk of sediment mobilisation that may affect water quality. A wide range of management options is available for preventing soil losses due to erosion.

Although broad inferences on erosion hazard can be drawn from information such as land systems mapping, recognition and prevention of soil erosion relies largely on judgements made at the coupe planning level. Foresters and soil scientists must determine the appropriate management of harvesting and other operations based on their assessment of local conditions and the nature of the operation. Accordingly, this Plan has adopted a guideline approach rather than attempting to zone the forest according to erosion hazard.

Management Guideline
Prevention of soil erosion

These guidelines are particularly important in designated catchments but should be applied in all forest areas.

Logging coupes and other large-scale forest operations should be carefully evaluated during planning to determine appropriate techniques for preventing soil erosion.

The following factors will be considered in determining erosion prevention techniques:

- **soil type** – granite-derived soils will generally have a greater erosion risk than sedimentary soils;
- **annual rainfall** – soils in areas with low annual rainfall will tend to have a lower organic component and therefore a greater erosion risk than corresponding soils in higher rainfall areas which will generally be better-structured;
- **seasonal rainfall** – erosion hazard and sediment runoff will increase if operations are carried out during or shortly after periods of wet weather. Harvesting should be timed to minimise the possibility of operations coinciding with extended periods of wet weather;
- **slope length** – long slopes create a greater hazard than short slopes;
- **logging technology** – rubber tyred skidders or wide track feller bunchers and excavation loggers reduce soil disturbance and compaction compared to narrow tracked machines which drag logs to landings;
- **sawlog resources** – logging on steep slopes or areas with a high erosion hazard to obtain relatively low sawlog volumes is not generally desirable; and
- **coupe planning and design** – landing management and location, snig-track grade and location, streamside reserve and filter strip widths, the extent of retained vegetation and the nature of regeneration operations can be varied to minimise erosion risks.

Slope is a major factor in determining erosion hazard. In designated catchments:

- logging may proceed on slopes up to 25° using standard *Code* prescriptions, enhanced as required by on-site conditions; and
- logging may proceed on slopes between 25° and 30° subject to the development and implementation of specific water quality prescriptions for designated catchments to be detailed in FMA forest management prescriptions. These prescriptions should include increases in the width and extent of streamside buffers and filter strips, should address the location and management of log landings, snig tracks and roads, and may provide for alternative harvesting and haulage methods such as cable logging.

ACTIONS

Manage logging and other soil-disturbing operations in accordance with the Guidelines for the Prevention of Soil Erosion.

Develop water quality prescriptions which specifically address harvesting slopes between 25° and 30° in designated catchments. Incorporate these prescriptions into the North East and Benalla–Mansfield FMAs Management Prescriptions for Harvesting and Regeneration.

Use field guides to assist in the delineation of harvesting boundaries based on soil permeability, potential for erosion, overland flow and slope. Incorporate these field guides in the North East and Benalla–Mansfield FMAs Management Prescriptions for Harvesting and Regeneration.

Coupe size and annual harvest area

The risk of adverse water quality impacts in a catchment will be influenced by the size of areas within the catchment that are subject to disturbance and the overall proportion of the catchment disturbed. Small logging coupes (relative to catchment size) and provisions that ensure logging operations affect no more than a small proportion of the catchment will add an extra layer of security for water quality.

ACTIONS

Limit the area of individual logging coupes to the limits specified in Table 5.2.

Limit the total area of coupes using even aged harvesting and regeneration systems, such as clearfell or seed tree operations, to 5% of the area of public land in designated catchments over any three-year period.

Fire

Wildfire in water-supply catchments can have a marked effect on water quality, and possibly water yield. Heavy rains following a fire event, before ground cover plants have re-established, can cause erosion, resulting in runoff with high levels of sediment and ash. This may seriously downgrade the colour and taste of water supplies as well as cause increased turbidity and suspended solid levels.

Hazards to water quality may also arise from the construction of bulldozed fire control lines necessary to control the spread of wildfire. These are routinely rehabilitated following completion of fire control operations. The *Code of Practice for Fire Management on Public Land* (CPFM) (CNR 1995c) addresses the protection of water quality in fire suppression and management operations. This will provide the basis for operational guidelines controlling these activities.

Fuel-reduction burning can reduce the intensity and spread of wildfire, enhancing the security of water supplies against the impact of wildfire. However, some of water quality impacts observed following wildfire may also arise following fuel-reduction burning, albeit to a lesser extent. A limitation in the extent of, and care in the conduct of, these burns will minimise this risk. This must, of course, be balanced with other fire-protection requirements.

Management Guideline

Conduct of prescribed fuel reduction burns in designated catchments

Consistent with NRE's legal obligations to carry out sufficient works to protect life and property from wildfire and the CPFM:

- the proportion of public land in designated catchment areas subject to prescribed fuel-reduction burning should be no more than 20% in any single year;
- fuel-reduction burning should be avoided in very small catchments or in close proximity to water storages; and
- fuel-reduction burns should be carried out when fuel moisture conditions impede spread of fire into riparian vegetation.

ACTIONS

Ensure that designated catchments are incorporated into Fire Protection Plans.

Ensure designated catchments receive high priority in post-fire rehabilitation works.

5.5 ROAD AND TRACK MANAGEMENT

Runoff from trafficked earth or gravel-surfaced roads has been identified as the major potential source of sediment inflows into streams in forested areas. The presence and use of roads in catchments is unavoidable. They are used for access to timber resources, for fire protection, for recreational use and for access to water storages. However, a number of measures can be taken to reduce the hazard of water quality degradation from roads. Some of the more important of these are:

- ensuring road design standards are appropriate for anticipated road usage, with particular attention to drainage;
- use of appropriate construction practices;
- careful design and construction of stream crossings;
- regular drainage maintenance programs;
- minimising the length of the road network in the catchment; and
- seasonal or permanent closure of roads.

NRE endeavours to maintain high standards of road design, construction, management and maintenance throughout State forest. Ensuring high standards is particularly important in designated catchments, and roads in these areas should be given a high priority in resource allocation decisions.

NRE has completed a Stream Crossing and Road Sedimentation Survey in catchments within the Corryong and Mitta Mitta areas. The aims of the survey are to provide information on the condition of roads and stream crossings, the cause of and remedy for any runoff problems, and extent to which they are contributing to stream sedimentation.

ACTIONS

Continue to survey roads and stream crossings within the North East as a basis for prioritising remedial works and identifying road closures (temporary or permanent).

As resources permit, progressively improve the design and drainage of the road network to standards outlined in the* Code *in order to minimise sedimentation run-off and meet appropriate road standards.

Ensure roads in designated and Spotted Tree Frog catchments receive a high priority in annual maintenance programs.

***Apply seasonal and permanent road closures as detailed in* Chapter 10 – Forest Roads.**

Ensure road maintenance staff, works crews and contractors are appropriately trained and that they plan, undertake and supervise road maintenance and construction techniques to ensure that sedimentation run-off from the roading network is minimised.

5.6 MONITORING

Water quality and stream flow at various sites in the North East Planning Area are regularly monitored through the Victorian Water Quality Monitoring Network (VWQMN). Stream flows are also monitored independent of the VWQMN as part of the State's hydrographic network. The EPA monitors water quality on a regular basis and other organisations, including research organisations, monitor water quality on an occasional basis. Catchment Management Authorities have adopted a statewide water quality monitoring program entitled Index of Stream Condition. There are also new techniques being developed for water quality monitoring through AUSRIVAS (AUStralian RIVers Assessment Scheme).

AUSRIVAS uses the presence or absence of stream aquatic macro-invertebrates to assess the impacts of off-stream management activities. Measures of the presence and diversity of macro-invertebrates can be used to provide a measure of both the extent of the initial disturbance and any subsequent recovery. The AUSRIVAS process may be used to monitor the impact of management activities including timber harvesting against reference sites to detect change. Currently, there are 101 reference sites established in the North East Planning Area that are appropriate. These will be used to set benchmark conditions to which monitoring sites established in the North East will be compared.

This information may be used either for short-term spot checks of catchment condition or to assist in detecting any long-term trends that may result from catchment use. The data collected in water monitoring programs need to be compared with agreed water quality objectives. The *State Environment Protection Policy – Waters of Victoria* (VicEPA 1998) establishes legal water quality objectives. As part of the National Water Quality Management Strategy (NWQMS), guidelines have been developed for Fresh and Marine Waters. These collate available scientific information to recommend water quality guidelines for aquatic ecosystems; drinking water; recreational water; industrial and agricultural water (ANZECC 1992). The Montreal Process (to which Australia is a signatory) has developed sustainability criteria and indicators for water quality and yield in forested areas. Water quality monitoring programs conducted in forested areas will need to address the reporting requirements for these criteria and indicators.

ACTIONS

Establish liaison processes with organisations involved in monitoring water quality and yield to regularly obtain water quality data relevant to State forest management.

Develop and implement water quality monitoring programs to measure stream health in forested catchments, which address:

- ***State Environment Protection Policy standards;***
- ***water quality in catchments used for domestic or industrial consumption; and***
- ***the biological condition of streams;***

and which conform with:

- ***Catchment Management Authority monitoring programs; and***
- ***forest monitoring programs developed under the Montreal Process.***

Where suitable sites are available, conduct periodic analyses (on a five to 10-year period) of catchment flow and quality data to detect any trends that may result from forest management practices.

Target catchments that have special values (including designated catchments and Spotted Tree-frog catchments) for monitoring where high levels of intensive management activities (including timber harvesting and road works) are occurring.

As well as monitoring outcomes of the management of forested catchments, it is important to monitor compliance with the measures directed to maintaining catchment conditions established in this Plan. The Forests Service has established a system of audits to ensure compliance with the *Code*. This system provides a framework for monitoring implementation of the measures for maintaining stream and catchment values detailed in this Plan.

ACTION

Assess compliance with catchment management measures established as part of the North East Forest Management Plan while undertaking audits of compliance with the* Code *and the North East and Benalla–Mansfield Management and Operator Prescriptions.

Chapter 6
FOREST PROTECTION

6.1 FIRE

Fire is a natural part of the environment. South-eastern Australia is recognised as one of the most fire prone regions in the world and unplanned fires (wildfire) can be disastrous. The North East has a history of periodic, large damaging wildfires. Wildfires may result when a combination of factors, including heavy fuel concentrations, droughts and extreme weather conditions, provide favourable conditions for the ignition and development of fire. However, properly managed, fire can be used beneficially:

- to protect life, property and public assets, by reducing fuel quantities and hence reducing the rate of spread and intensity of a fire;
- to create suitable site conditions for seedling regeneration following the harvesting of trees; and
- for other forest management purposes, including habitat management and weed control.

Aboriginal use of fire included cooking, warmth, hunting, improving access, and habitat manipulation. The repeated incidence of fires before European settlement, resulting from lightning and activities of Aboriginal people, shaped the development of native plant and animal communities. Fire regimes (described by their frequency, intensity and timing) were altered by early squatters who used fire to promote new growth of grasses and to assist in land clearing.

The forests of the North East range from the wet or damp sclerophyll forests at higher elevations to the drier forests found at lower elevations. Fires in wet sclerophyll forests are less frequent and more intense than fires in the drier forests. High intensity fires in wet sclerophyll forests often result in the death of dominant trees. In drier forest types, moderate to high intensity fires may cause loss of tree crowns but these are replaced initially by epicormic growth along the stems of the affected trees. Plants in these forests have a number of other adaptations, such as regeneration of stems from lignotubers or the crown from epicormic buds, hard-coated seeds and thick insulating bark, that enable the species to survive fire.

The *Forests Act* 1958 requires NRE to '*carry out proper and sufficient work for the prevention and suppression of fire in every State forest, National Park and all protected public land*'. Fire management on public land in the North East is based on Regional Fire Protection Plans for Benalla (CNR 1995g), Alexandra/Broadford (CNR 1995f) and North East (DCE 1990b). The *Code of Practice for Fire Management on Public Land* (CPFM) defines:

> 'principles, standards and guidelines that apply to fire management on all public land in Victoria to ensure that, in an effective, efficient and safe manner:
>
> - human life, property and assets are protected, as far as is practicable, from the deleterious consequences of wildfire;
> - environmental values including the vigour and diversity of the State's indigenous flora and fauna are protected, as far as is practicable, from the deleterious effects of wildfire and inappropriate fire regimes;
> - water catchment, airshed and landscape values are conserved; and
> - archaeological, historical and other cultural values are conserved.'
>
> (CNR 1995c)

A number of important forest values which can be adversely affected by fire are identified in this Plan, include:

- high quality timber stands;
- water quality and yield;
- cultural values (including landscape, Aboriginal places and post-contact historic sites); and
- fire sensitive threatened flora and fauna.

The purpose of this section is to outline principles for fire management in the North East and to ensure that it is carried out in accordance with the *Forests Act* 1958, the CPFM and NRE's fire protection strategies outlined in regional and district fire protection plans.

Aims

Ensure that management strategies in the Forest Management Plan and those in Fire Protection Plans covering the North East are complementary.

Ensure that fire protection strategies consider ecological requirements in conjunction with the requirement to provide adequate protection of adjacent landholders and forest assets.

Wildfire

The single most common cause of fires in the North East over the last 20 years was lightning. Lightning was responsible for approximately 42% of fires on public land. Humans either deliberately or accidentally caused approximately 40% of fires on public land. Other sources of fires include waste disposal, power transmission and fires where the source could not be identified. Appendix P details the causes of wildfires on public land between 1978 and 1997. Most fires in the North East occur between November and April.

Few wildfires have burnt more than 5 ha and major ones, which exceed 400 ha, are rare. NRE records indicate that 1 792 fires occurred in the twenty year period and of these 1 505 (84%) burnt less than 5 ha. In the 20 year period to 1997, 28 fires burnt more than 400 ha, and all combined, burnt over 126 057 ha of public land. The largest of these fires occurred in 1985 and burnt 52 730 ha of public land (see Appendix P).

The adverse impacts of fires on natural and timber values of forests may be substantial. The effects of major wildfires on natural values include removal of the mosaic of forest habitat structure, local food shortages for some animal and bird species and exposure of soil to erosive processes. Animals may be killed. The impact of this can be amplified in isolated smaller forested areas within the North East by the absence of links to other large forest areas from which recolonisation of the burnt areas can occur. Harvesting of salvageable wood may mitigate the reduction in timber values that occurs when a mature forest is burnt, but when a young forest is burnt, no timber can be salvaged. The greatest loss to timber values occurs when the trees are almost of sawlog size (at about 60 years of age) and there are limited opportunities for salvage. The effect of these fires on timber values is discussed further in Chapter 4 – *Timber Production*.

Where the tree crowns regenerate, salvage harvesting may be unnecessary, although epicormic growth usually produces defects in subsequent wood. Ash species are relatively more sensitive to fire than other eucalypts and are more likely to be killed by wildfire. Assessment of post-fire recovery will determine the amount of area requiring salvage harvesting.

Prescribed fire

Prescribed fire is used as a management tool to regenerate harvested forest, reduce fuel loads, and manipulate habitat.

Generally, prescribed fires are carried out in the late summer and autumn months, when weather conditions are favourable for management and control of fire.

The effect of fire on various flora and fauna species varies widely and depends on:

- the particular species' adaptations for survival;
- habitat requirements;
- season, intensity, frequency and extent of the fire; and
- the health of individual plants or animals.

While information is available on the response of certain individual species to fire, very little is available detailing the response of plant and animal communities. In 1984, a multi-disciplinary research program was initiated by NRE to study the ecological effects of repeated fuel-reduction burning. Five long-term fire-effect study areas are established in the Wombat State forest (Midlands Forest Management Area) to assess and describe the effects of repeated (rotational) spring and autumn fuel-reduction burning on flora, fauna and soils, the functional process of the dry sclerophyll forest system, and the short- and long-term stability of such ecosystems (CNR 1992a).

The following preliminary findings of the studies relate to the application of fuel-reduction burning.

- Within two years of spring burns and four years of autumn burns, fuel loads on the forest floor reach levels equivalent to areas that have remained unburnt for more than 30 years. However, the structure and amount of shrub and bark fuel is modified for more than 10 years, and this markedly reduces the 'spotting' potential over this period.
- The diversity of animal habitat and structure of plant populations were reduced in the short term.
- Unburnt patches can be important to the survival and recolonisation of the burnt area by invertebrates, small mammals, reptiles, birds and plants.
- Areas subject to rotational burns of less than three years should be scheduled for autumn burns rather than spring burns.
- Nitrogen levels in soils may be reduced if burns occur at less than 10-year cycles.
- Rotational spring burning may result in longer-term ecological effects.

The report indicates that ecosystem management in Victoria may require diverse fire regimes rather than regular cyclic burning. The research work will also compare repeated fuel-reduction burning with both the effects of less frequent high-intensity wildfire and fire exclusion (CNR 1992a).

ACTION

Address the findings of relevant research programs when the Fire Protection Plans are reviewed.

Fuel-reduction burning

The aim of fuel reduction burning is to reduce available fuels, so that wildfires in the fuel-reduced area burn at a lower intensity and are easier to suppress than areas with high fuel loads. The frequency of burning will depend on the priority for fuel reduction, the rate of accumulation and decomposition of fuel and the spatial arrangement of bark, shrubs and other fine fuels.

An essential element of fire plans is a zoning system for fuel-reduction burning, designed to help protect life, property and assets. Desired levels of fuel loads and the frequency and priority for burning are set for each zone. By maintaining low fuel levels in strategically placed zones, the development of major wildfires that originate inside, or spread into, the fuel-reduced area is hindered. Public land is therefore zoned for fuel-reduction burning to provide the most cost-effective protection with due regard given to the range of all forest values and to fire plans developed by other agencies, such as Municipal Fire Prevention Plans.

The CPFM defines five fuel management zones and indicates how they are to be applied on public land. Fuel-reduction may be applied in only three of the zones, the other zones either apply to the management of specific flora and fauna or require the exclusion of prescribed burning. Fire protection plans will nominate the desired range of fuel characteristics (within specific limits) for each of the three protection zones. A brief description of the five zones is contained below:

- ***Zone 1 – Asset protection*** provides the highest level of strategic protection to human life, property and highly valued public land assets and values. This zone will normally occupy only a small proportion of public land.
- ***Zone 2 – Strategic fuel-reduced corridors*** comprises corridors of sufficient width and continuity to provide a substantial barrier to the spread of fire, to minimise the damage caused and areas to assist in safe and efficient fire suppression.
- ***Zone 3 – Broad area fuel-reduced mosaic*** will provide an irregular mosaic of areas where fuel reduction will complement works undertaken in Zones 1 and 2.
- ***Zone 4 – Specific flora and fauna management*** will provide for the use of prescribed burning for the active management of specific flora and/or flora.
- ***Zone 5 – Exclusion of prescribed burning*** will provide for the exclusion of prescribed burning for at least the period of the Plan from areas of vegetation in which there would be high potential for economic, ecological or cultural loss if it was subjected to prescribed burning.

Where SPZ is located in Zones 1 and 2, the ecological requirements of the values within the SPZ which may be affected by fuel reduction burning, will be considered in the development of fire operations plans. Wherever possible, fuel reduction burning programs that maintain SPZ values, but do not compromise the objectives of the fuel management zone will be preferred.

The irregular mosaic of areas created by Zone 3 prescribed burning is unlikely to affect most SPZ values. However, where records of rare or threatened flora species (included in the SPZ or SMZ) occur within Zone 3, fuel reduction burning may be excluded from or modified in these locations. The role of fire in ecosystem management is discussed further in the Habitat Management Burning section (below).

ACTIONS

Carry out fire protection and management works in accordance with the Strategic Fire Protection Plans covering the North East area, and associated Fire Operations Plans.

In reviewing Fire Protection Plans and Fire Operations Plans, consider:

- ***strategies for protecting high quality timber stands, particularly advanced regrowth, and thinned areas from wildfire;***
- ***the use of fuel-reduction burning within high quality timber stands;***
- ***strategies that consider the ecological values of the SPZ;***
- ***strategies for protecting important cultural values from wildfire;***
- ***the purpose and objectives of the forest management zoning scheme established in this Plan; and***
- ***timing, distribution, intensity and extent of burn within fuel-reduction burning zones.***

Permit other activities in areas defined as Zone 1 in the Fire Protection Plans where they do not significantly affect the management objectives of the zone.

Habitat management burning

Prescribed burning is a powerful tool for manipulating ecosystems to achieve biodiversity or pest control objectives. Many plant communities are adapted to specific fire regimes and depend on the continuation of that regime for their existence. Some animal species such as the Smoky Mouse, appear to be adapted to survival in vegetation communities at a particular stage of post-fire succession. Populations of pest plants such as wildling pine trees and English Broom can be modified by careful use of planned fire.

The use of fire to achieve biodiversity goals in State forest has been rarely practised within the North East, reflecting a lack of knowledge of desired fire regimes and limitations on resources available for the purpose. Fuel reduction burning programs may provide opportunities to incorporate habitat management objectives as information becomes available and fire management objectives can be determined on an ecosystem basis.

NRE in conjunction with Parks Victoria has established a Fire Ecology Working Group in order to promote the development of burning regimes taking into account ecological characteristics of plant and animal communities.

ACTIONS

Identify, as ecological information becomes available, and include within Fire Protection Zone 4 or Zone 5, those flora and fauna communities that require a particular fire regime or fire exclusion.

Consider the ecological effects of wildfire and fuel reduction burning and, where consistent with fuel reduction burning objectives, use fuel reduction burns to achieve ecological goals.

Use prescribed burning as appropriate to assist in the control of pest plants.

Regeneration burning

Many Victorian forest plants, including the dominant eucalypts, regenerate prolifically following fire. Fire is also an important component of the regeneration techniques practised in the North East. The use of fire to induce regeneration reduces competition for developing seedlings, provides a receptive seedbed, enhances germination levels and reduces the high fuel hazard that results from harvesting operations.

Usually, a moderate to high intensity fire is used to burn coupes following timber harvesting using seed tree or clearfall silvicultural systems. The fire is hot enough to induce seed fall from the retained seed trees and creates a suitable seedbed. Where timber harvesting is selective, a less intense fire may be used to induce seed fall, but not excessively scorch or kill the surrounding retained trees. In these circumstances, mechanical disturbance is more important than the fire in creating a suitable seedbed.

ACTIONS

Continue to use fire in forest regeneration operations, where it is required to facilitate regeneration or to reduce the fuel hazard created by logging slash.

Refine and develop the prescriptions for regeneration burns based on field experience, fire and silvicultural research findings.

6.2 PEST PLANTS AND ANIMALS AND PLANT DISEASES

While best known for the losses they cause in agricultural land, pest plants and animals and diseases can also adversely affect economic and environmental values of public land. Pest plants bring about a reduction in the health and regenerative capacity of native plants, changes in vegetation composition and associated loss of habitat for native fauna. Pest animals in native forest disrupt natural ecosystems through competition for resources, by direct predation or by grazing of native plants. Grazing or burrowing by pest animals also disturbs vegetation and soil, allowing weeds to establish and contributing to erosion on susceptible sites.

The effectiveness of pest control programs on agricultural land can be reduced if the pest species are present on neighbouring public land. Likewise, forest and conservation reserve values can be compromised if adjacent freehold land contains infestations of pests that may spread onto public land. Because plant propagules and pest animals cross land management boundaries, effective pest control must be coordinated across both public and private land.

NRE monitors pest infestations and control programs using the Pest Management Information System (PMIS), a computerised database (Lane and Backholer 1990). This system supports:

- preparation of pest management plans;
- allocation of resources and the implementation of control programs; and
- monitoring the effectiveness of control programs.

Legislation that directs pest control in State forest is as follows:

- *Catchment and Land Protection Act* 1994 provides for the classification of weeds and pest animals and for their eradication or control. It also establishes a system of community consultation through Catchment Management Authorities which prepare Regional Catchment Strategies; and the
- *Flora and Fauna Guarantee Act* 1988 lists predation of native wildlife by the introduced Fox (*Vulpes vulpes*) and the spread of gravel infected by Cinnamon Fungus (*Phytophthora cinnamomi*) as potentially threatening processes.

The *National Forest Policy Statement* (Commonwealth of Australia 1992a) calls for forest management agencies to monitor and appropriately control the threat to publicly-owned native forest ecosystems posed by feral animals, exotic plants, pests and diseases. Consistent with this, the *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a) requires that forests be 'protected from the introduction of and spread of pest plants and animals, including plant diseases and insect pests, and managed in a manner which limits the development of epidemics of endemic pests and pathogens'.

The *Good Neighbour Program* is a major policy initiative, which allocates resources towards cooperative weed and pest animal control programs on the freehold/public land boundary. Under the program, NRE works with landholder groups and local government to identify pest control needs and to undertake coordinated work on both public and private land, bringing benefits to both landholders and the values of public land. The *Good Neighbour Program* currently provides most of the resources for pest plant and animal control in the North East. In addition, the *Rabbit Busters* program related to the release of the Rabbit Calicivirus Disease, also contributes resources to rabbit control in the North East. The program is principally for private lands and the interface with public lands.

Aims

- ***Protect the ecological, economic and cultural values of State forest from damage by pest plants and animals and diseases.***
- ***Prevent the introduction of new pest species into the North East, or their spread into sensitive areas.***

Planning and programming for pest plant and animal control

Effective pest plant and animal control requires well planned and designed programs. The priorities for control of pest species in State forest should have regard for not only the management goals of State forest, but also the overall catchment priorities expressed in the Regional Catchment Strategies and associated Action Plans. Consultation and coordination with regional Catchment Management Authorities and, where necessary, with Landcare groups and individual landholders to develop agreed priorities and implement joint action is also required.

An essential initiative of this Plan is to introduce rolling three-year works planning for the control of pest species. This approach contributes to implementation of the *Victorian Weeds Strategy* (NRE 1998g) which sets the objective of ensuring ongoing coordinated management of weed problems within Victoria. The works plans will:

- ensure pest plant and animal control programs will be implemented within the framework established by this Plan;
- provide a vehicle for consultation with Catchment Management Authorities (CMAs) and community groups;
- ensure funding is allocated to areas of greatest need; and
- ensure any necessary follow-up works are identified in advance and included in annual programs.

Management Guideline
Pest plant and animal control programs

Programs should be conducted:

- with due regard to cost and efficiency;
- using methods which are defined in relevant NRE policies and guidelines;
- in consultation with relevant CMAs and Landcare groups; and
- with an evaluation program.

Preparation and implementation of programs for State forest in the North East should be based on the framework established by this Plan, CMA Regional Catchment Strategies and Action Plans and relevant legislation and policy. These programs should be prepared on a rolling three-year basis and include:

- maps showing the location of areas proposed for treatment;
- any cooperative management arrangements with adjoining land managers;
- the nature of infestations;
- the threat posed by infestations;
- control methods to be used;
- necessary follow-up works; and
- program evaluation.

Pest plants

Infestation by pest plants of State forest occurs mainly along the boundaries with freehold land, beside roads and tracks, along watercourses and on disturbed sites such as picnic areas and log landings. Although many forests of the North East have a long history of utilisation and disturbance, the interior of forest areas, where disturbance has been relatively minor, is generally free of significant infestations. Although there is potential for progressive invasion from the margins, timber harvesting and other management activities potentially provide opportunities for pest plant species to establish.

The introduction and spread of the propagules of pest plants through the forest is aided by:

- dumping of garden rubbish and soil;
- vehicles and machinery (in tyres, radiators or in adhering mud);
- movement of sand and soil;
- animals, including sheep, cattle and native animals (seeds dropped during feeding or in the coat or dung); and
- water movement in streams and channels.

A number of exotic plants have become naturalised and, in most cases, eradication is not feasible. Several species are capable of aggressive invasion of forest areas.

Pest plants may be declared 'noxious weeds' under the provisions of the *Catchment and Land Protection Act* 1994. The Act also provides for their categorisation as State Prohibited, Regionally Prohibited, Regionally Controlled or Restricted (see Table 6.1).

Table 6.1 Classification of weeds under the *Catchment and Land Protection Act* 1994

Category of weed	Definition
State Prohibited	a) it does not occur in Victoria; or b) it occurs in Victoria but it is reasonable to expect that it can be eradicated from the State.
Regionally Prohibited	a) it is not widely distributed throughout the region; and b) it is capable of spreading further in the region; and c) it is reasonable to expect that it can be eradicated from the region.
Regionally Controlled	a) it occurs in the region; and b) it is capable of spreading further in the region and should be stopped from doing so; and c) to prevent its spread, continuing control measures are required.
Restricted	a) it is a serious threat to primary production, Crown land, the environment or community health in another State or Territory; and b) it has the potential to spread into and within Victoria; and c) if sold or traded in Victoria there would be an unacceptable risk of it spreading within Victoria and to other States or Territories.

At present, the only State Prohibited weed that is known to occur in the State forests of the North East is Blacknap Weed *(Centaurea nigra*) which is found in the Ovens Valley. Regionally Prohibited and Regionally Controlled weeds occurring in, or on the margins of, State forest are listed in Appendix Q. The most common and widespread of these are Blackberry, St John's Wort, Spear Thistle and Paterson's Curse and to a lesser extent, Bridal Creeper, Bathurst Burr and English Broom.

Blackberry is widespread in the North East and often forms dense, thorny thickets along streams and roadsides in higher rainfall areas. This growth habit causes large areas of forest to be unsuitable as habitat for native wildlife, interferes with recreation activities and can provide harbour for pest animals. Blackberry control works will continue to feature in Good Neighbour programs across the North East. Other weeds, such as St John's Wort, can establish following disturbance by timber harvesting and road construction activities and can invade undisturbed areas. Paterson's Curse is widespread on agricultural land in the upper North East and along the private land—public land boundary where it can be found in State forest. However, it does not usually occur within forested areas and is unlikely to pose a problem in the future.

Some weeds do not currently pose a problem in State forests in the North East, but have the potential to do so in the future. English Broom, for example, occurs in small isolated patches in the higher elevation wetter forests, where it can be particularly invasive. When detected, new infestations will be integrated with pest plant control priorities to eradicate the weed where possible, or contain any further spread.

Some naturalised non-indigenous plants have not been declared under the *Catchment and Land Protection Act* 1994, but may still pose a threat to forest values. These are regarded as 'environmental weeds'. Often escaped pasture or garden species, these plants are not considered to be agricultural pests, but can adversely affect the survival or regeneration of native plant species. Some of the more significant environmental weeds in addition to Regionally Controlled or Regionally Prohibited weeds, found in State forests of the area include Blue Periwinkle (*Vinca major),* Himalyan Honeysuckle (*Leycesteria formos)* and Cork Elm (*Ulmus* sp.).

Spraying with herbicide, or cutting and poisoning are the main methods of pest plant control used in forests, depending on the particular weed species and their location. A biological control method is used for the control of Blackberry. In areas of State forest close to population centres, mechanical removal and spraying of weed infestations are also used as fire prevention measures. NRE is continuing to investigate improved methods of pest plant control.

Management Guideline
Control of pest plants

Allocation of resources for pest plant control should account for the potential for successful eradication and control while regarding the following priorities:

- State Prohibited weeds;
- Regionally Prohibited weeds;
- new weed infestations of any classification which can be feasibly eradicated;
- Regionally Controlled weeds where these have an environmental or economic impact on State forest values; and
- environmental weeds which have a significant effect on ecosystem diversity.

Allocation of resources to particular infestations should account for:

- their impact on State forest values;
- the conservation of rare or endangered native flora and fauna;
- neighbouring parks, reserves and reference areas; and
- their impact on nearby agricultural land (in keeping with the *Good Neighbour Program*).

The effectiveness of weed control programs should be monitored to:

- ascertain the rate of control or further spread;
- determine if follow-up work is required; and
- determine if control practices require modification.

ACTIONS

Prepare and implement three-year pest plant control programs for State forest in the North East based on Catchment Management Strategies, Guidelines for Control of Pest Plants and relevant legislation and policies.

Maintain comprehensive records of the locations of pest plant infestations and control actions taken.

Implement hygiene practices for all plant and machinery working in areas known to have significant infestations of pest plants. Specifically:

- ***subject NRE machinery to hygiene standards, detailed in works prescriptions;***
- ***require that contract machinery conforms to machinery hygiene standards through the inclusion of appropriate clauses in contracts; and***
- ***subject timber harvesting machinery to hygiene standards through FMA timber-harvesting prescriptions and coupe plans.***

Seek opportunities to implement cooperative management programs with community groups involved in pest plant control activities.

Plant diseases

Depending on the type of pathogen and its interaction with climate, soil type, aspect, altitude and disturbance, plant diseases can seriously impact on forest ecosystems. Cinnamon Fungus (*P. cinnamomi*) is the most well known forest pathogen. It is not known to occur in the State forests of the North East, however, there are occurrences in the Warby Ranges and Buckland Valley in the Alpine National Park. Minor outbreaks of other

pathogens have been observed, however, they have been short-lived. The most recent outbreak of disease observed in State forest was in 1996, when *Aulographina eucalypti* (Target Spot) was identified as causing defoliation of *Eucalyptus delegetensis* trees growing near The Hollow, north east of Mount Bogong. The stands have now recovered.

Cinnamon Fungus

A water-borne organism living in the soil, Cinnamon Fungus attacks and destroys the roots of many native and introduced trees and shrubs, often leading to the death of plants. The death of Austral Grass Trees (*Xanthorrhoea australis*) in a forest area is often an indication of infection. Once the disease is established in a susceptible community, there is no known means of eradication.

The disease is favoured by the following conditions:

- gravel or soils of low fertility containing little organic matter;
- soil temperatures of at least 10^0C; and
- wet weather during spring, summer and autumn.

Cinnamon Fungus is primarily spread through the use of infected gravel in road construction and in run-off of drainage water from infected sites. Infected soil adhering to vehicles and machinery (particularly when used off-road) could introduce the disease into uninfected areas of forest.

Although, Cinnamon Fungus is currently not known to occur in State forest in the North East, it has the potential to do so in the future. The National Parks Service '*Policy and Procedures Manual'* (NPS 1994; NPS 1995a; NPS 1995b) includes a guide to control of Cinnamon Fungus and specifies hygiene practices which are appropriate to management of the disease in State forest.

Management Guideline
Cinnamon fungus control

Active measures should be implemented to minimise the risk of introduction or movement of plant diseases from known infected areas, into uninfected areas.

Hygiene measures to contain and control the spread of Cinnamon Fungus include:

- washing machinery before moving into uninfected areas;
- restricting activities where the movement of soil or gravel is likely to cross from infected sites into healthy vegetation;
- minimising the relocation or movement of infected gravel or soil during road and track construction or maintenance works, logging operations or wildfire suppression and pre-suppression works;
- restricting or controlling drainage water run-off from roads and tracks away from healthy vegetation;
- testing gravel from infected areas and using only uncontaminated gravel in uninfected areas; and
- cleaning and disinfecting vehicles, machinery, tools and equipment used in infected areas.

The effectiveness of hygiene practices should be monitored to:

- ascertain effectiveness of control measures or rate of further spread;
- determine what follow-up work is required; and
- determine if control practices require modifications.

ACTIONS

Implement the Cinnamon Fungus control guidelines as the general basis for control of the spread of the disease.

Maintain records of the locations of all Cinnamon Fungus infestations and other pathogens.

Insect pests

Insect pests usually affect forest ecosystems through defoliation and sometimes death of trees. Some species cause degradation of timber values by boring into sapwood or heartwood. Minor outbreaks have been recorded in the State forests of the North East. In the 1960s and 1970s, Spur-legged Phasmatids (*Didymuria violescens*) required extensive control programs. Currently, the psyllid, *Cardiaspina bilobata* is affecting stands of Mountain Ash in the Handford Creek area (Benalla–Mansfield Forest Management Area) causing defoliation and sometimes tree death. The growth of the forest and volume production may be reduced as a result of psyllid attack, however, at this stage, the outbreak is limited in extent and the stands appear to be recovering. In the Mountain Ash forests of the Central Highlands, the extent and severity of psyllid attack is greater than in the North East. Research is being undertaken to determine the reasons for the current outbreak and the most appropriate methods for control. A Psyllid Management Plan (CNR 1995e) has been developed.

ACTIONS

Implement the Psyllid Management Plan where necessary.

Record and monitor outbreaks of insect pests and control where appropriate.

Pest animals

Many species of pest animals have become established in Australia as a result of deliberate or accidental releases. In 1997, the *Catchment and Land Protection Act* 1994 was amended to classify exotic animals (previously referred to under the Act as pest animals) as either Prohibited, Controlled, Regulated or Established. Classification is dependent on the threat that particular types of animals pose to primary production, Crown land, the environment or community health

Foxes, wild dogs and rabbits are common and widespread in the North East region and are often most common at the interface between the forest and private land. Effective control of these pests requires cooperative programs with adjacent landholders. Other animals considered as pests, but which are localised or less common, include feral goats and pigs. Feral pigs are known to occur in a number of areas including the Strathbogie Ranges, Mount Pinnibar and forests around Koetong. Several deer populations exist in State forest in the North East. Feral cats are also considered widespread, however, their abundance and impact on native fauna in is unknown. Predation of native wildlife by the introduced Red Fox and Cat have been listed as Potentially Threatening Processes under the *Flora and Fauna Guarantee Act* 1988.

Browsing by rabbits in conjunction with other browsing animals, such as wallabies, may damage regeneration following timber harvesting. Erecting fences and tree guards and the application of repellents can be effective means of limiting this type of damage.

Control of rabbits is generally concentrated around forest perimeters, mainly using 1080 (sodium monofluoroacetate) poison. Myxomatosis remains an effective control mechanism and has more recently been augmented by the introduction of the Rabbit Calicivirus Disease (RCD). The RCD, however, has had only limited effect in the North East region. Wild dog control includes snaring and strategic 1080 use. 1080 is used in the forms of buried bait, such as Foxoff® for foxes and meat baits for wild dogs and poisoned carrots for rabbits. Close to built-up areas, Pindone® is often used in place of 1080 as it has no secondary poisoning effects. Recent trials in the North East using cyanide baits have shown this control method to be highly effective at fox control. Additional research is now in progress that is intended to assist and improve predator control programs of the future. Wild dog control is primarily for the protection of livestock, while control of foxes and rabbits can provide significant environmental benefits particularly to endangered fauna and significant EVCs.

The protection of non-target species is an important component of any program for the control of pest animals. Where poisoning campaigns may affect non-target wildlife such as the endangered Spot-tailed Quoll, control programs are carried out in consultation with NRE wildlife biologists. The Spot-tailed Quoll, a native high order predator, is considered to be susceptible to the use of 1080 baits in predator control programs (refer to Chapter 3 – *Biodiversity Conservation* for a more detailed description of this species). In order to minimise the chance of poisoning Spot-tailed Quolls, guidelines have been developed for predator control programs using 1080. These guidelines outlined below should be considered as interim measures until the Strategic Plan for Wild dog Control and associated Action Plans (prepared by NRE and CMAs) are implemented.

Management Guideline
Use of 1080 in State forest

In order to minimise the chance of poisoning Spot-tailed Quolls, predator control programs should adopt the following principles:

- bait stations should be constructed by excavating to ensure the bait will be placed below ground level. Where practicable, the surface should be constructed from sieved earth. Bait stations constructed in this manner are easy to maintain and the friable surface enables better identification of animal tracks;
- baits should be buried at a depth of 10 cm or greater. Spot-tailed Quolls are not known to forage fossorially and are unlikely to excavate baits at this depth;
- only one bait should be buried in each bait station at any one time;
- the distance between bait stations should be varied depending on terrain and pest species activity. A minimum separation of one kilometre between baits is recommended to limit the possibility of multiple bait take by a single animal; and
- the use of free feeding for a period prior to burying poison baits should be considered. Free-feeding encourages the resident feral animals to visit the bait station and provides information about the numbers and kinds of animals visiting the bait station.

The RCD, a biological control agent for rabbits, occurs within the North East. Laboratory trials and overseas experience confirm that only European rabbits are susceptible to RCD, which is transmitted by rabbits and possibly other vectors such as birds and insects. Experience in the release of other biological control agents show that successful rabbit eradication in an area will require the traditional control measures (shooting, baiting, fumigation and ripping of burrows) to be used in concert with outbreaks of the RCD.

As many pest animals move between State forest, adjacent parks and private land, effective control involves cooperation between neighbouring land managers. Group pest control schemes result in better success and yield greater community and departmental benefits.

Management Guideline
Control of pest animals

Priority should be given to control of Prohibited, Controlled, Regulated or Established pest animals as required by the *Catchment and Land Protection Act* 1994, and to the management of threatening processes listed in Schedule 3 of the *Flora and Fauna Guarantee Act* 1988.

Direction of resources to particular pest species should account for the potential for successful eradication and control as well as for their impact on:

- State forest environmental or economic values;
- the conservation of rare or endangered native flora and fauna;
- neighbouring parks, reserves and reference areas; and
- neighbouring agricultural land.

Pest animals of particular importance for control in the North East include:

- rabbits, because of their impact primarily on agricultural pastures and flora species;
- foxes, because of their ecological impacts;
- dogs, because of the threat they pose to livestock;
- feral goats and pigs, because of their potential to cause serious damage to forest environments and their potential role as livestock disease vectors; and
- feral cats, because of their impact on native wildlife.

Pest control programs should be monitored to:

- ascertain effectiveness of control;
- determine if follow-up work is required;
- ascertain effects on non-target species; and
- determine if control practices require modification.

ACTIONS

Prepare and implement three-year pest animal control programs for State forest in accordance with the North East Regional Forest Agreement, based on Catchment Management Strategies, Guidelines for Control of Pest Animals, Guidelines for the use of 1080 in State forest and relevant legislation and policies by 2004.

Maintain comprehensive records of the occurrences of pest animals and control methods taken.

Chapter 7
TOURISM AND RECREATION

Each year, many thousands of people from the cities and towns in North East Victoria, the greater Melbourne area and interstate visit the forests of North East Victoria seeking recreation opportunities in a natural environment. Forest recreation opportunities are a significant part of the region's attractiveness to tourists. Even those visitors who do not enter forests enjoy the forested landscapes surrounding towns such as Corryong, Bright, Beechworth, Myrtleford and Mansfield.

Aim

NRE aims to provide public land recreation and tourism opportunities that are high quality, diverse in their nature and setting, satisfying and safe. They should also be environmentally sustainable, economically viable and offer equity of access.

7.1 TOURISM

The strategic tourism framework for Victoria is established through Regional Tourism Development Strategies. Most of the North East lies within the *Legends, Wine and High Country* product region, with some south-western localities such as the Strathbogie Ranges within *Goulburn Murray Waters* and areas along the Murray River within the *Murray* region. The North East is promoted with strong natural (High Country), cultural (wineries, bushrangers and mountain cattlemen) and historic (mining) themes. These themes, with the exception of wineries, are inter-twined with the Parks and State forests of the region. Adventure activity pursuits are another strength of the region.

North East Victoria includes some of the most significant and concentrated areas for outdoor activities in Victoria and much of it occurs on forested public land. Both State forests and the parks and reserves system are popular and complement each other as visitor destinations. State forests of the North East are estimated to attract around 360 000 visitor days per year (Read Sturgess and Associates 1995). State forest may be the primary attraction of the tourist visit, or may add to the tourist experience by providing natural surroundings and an appropriate setting for other activities.

Many visitors to major tourism centres in the North East enjoy short drives through the forest and use picnic facilities provided along their route. Beechworth, Bright and Mansfield are tourism hubs where investment and employment in tourism is a major part of the local economy. These towns draw heavily on their nearby forest setting as part of the tourist experience, as do the 85 licensed tour operators using State forest areas in the North East.

Aims

- ***Provide nature-based tourism opportunities that are consistent with the other objectives of this Plan and that are complementary to those provided by parks and reserves.***
- ***Participate in and integrate tourism planning and promotion with peak tourism bodies and local government.***

NRE's Tourism Strategy

NRE's Tourism Strategy (NRE 1996b) recognises the complementary nature of State forest sites and services to those of National Parks and other reserves and to a lesser extent, the alpine resorts and private sector tourist attractions in towns and on freehold land. It recognises that many of the more popular attractions are found in forests managed by Parks Victoria. It also recognises that NRE has an existing and on-going role in

providing for recreation pursuits that attract the majority of forest visitors to State forest. The strategy recognises the need for a range of sites and services within budgetary limitations and the need to manage environmental impacts of visitors at high-use sites.

NRE's contributions to tourism include:

- provision for a wide range of recreational activities, and provision of robust, appropriately sited and well-maintained recreation facilities in State forest;
- development (in consultation with other land managers and tourism authorities) and maintenance of remote four wheel drive touring circuits, linked to key campsites and attractions;
- provision of appropriate infrastructure at key day-use and camping sites;
- maintenance of walks and picnic stops that service key tourist hubs;
- provision of information on forest activities, facilities, routes and destinations, both in printed form and the World Wide Web;
- signage of forest roads, tracks and recreation sites;
- interpretation of natural and cultural features found on State forest;
- facilitation of the use of State forest for licensed tours; and
- management and conservation of natural and cultural features, including landscape, particularly along designated tourist routes.

NRE is keen to facilitate the ongoing development of nature-based tourism that is ecologically sustainable and yields appropriate economic and social benefits, provided activities are conducted in a manner that maintains other forest values. Currently a wide range of licensed tour operators run tours in State forest, providing opportunities for forest-based recreation including four wheel drive tours, horse riding, rafting, canoeing and bushwalking. Such activities are regulated through NRE's Licensed Tours Permit System, which operates across all public land.

On-going and future commercial operations will be assessed on their merits, compatibility with the maintenance of forest values, directions set by recreation management zones, Regional Tourism Development Strategies and through the appropriate participation of stakeholders.

The *North East Comprehensive Regional Assessment* (VicRFASC 1998a) provides more information about tourism and recreation pursuits in the North East.

A list of recreation and tourism-related works and current pamphlets relating to State forest areas, are found in Appendix T and R respectively.

ACTIONS

Maintain liaison with regional tourism organisations to assist coordination of NRE tourism services with those of other land managers and the private sector.

Facilitate the development of nature-based tourism ventures while ensuring that operations maintain environmental and recreational values and minimise conflicts with other users.

Monitor and report on the level and nature of tourism in State forest.

7.2 RECREATION MANAGEMENT ZONES

A diverse range of people visit State forests to undertake a variety of different activities. The type of forest setting that visitors require to enjoy their activity also varies. The aim of NRE is to manage forest settings and the activities that occur within them to provide visitors with opportunities to enjoy a broad range of recreational experiences.

Different types of recreation activities require different settings and levels of facilities. NRE has broadly divided the State forests of the North East into Recreation Management Zones (RMZs) (see Map 4). The zones (see Table 7.1) offer a range of settings, which are managed to help ensure that a wide range of recreational activities and experiences can be catered for and the recreational needs of one group do not adversely affect the needs of others.

Developed sites (Zone 1) cater for high levels of visitor use and facilities may include tracks, toilets, picnic tables, fireplaces and interpretative signs. At the other extreme are remote sites (Zone 4) where there is little visible management presence and few people, where there could be a remote bush camping site reached only on foot or by a challenging 4WD track.

Table 7.1 Opportunities and experiences available in recreation management zones

	Zone 1	Zone 2	Zone 3	Zone 4
Activities[1]	Picnicking, short walks, nature study and motorised sight seeing.	Motorised sight seeing, walking, horse-riding, camping, picnicking, mountain-bike riding, rogaining, nature study and orienteering.	Walking, four-wheel-driving, trail-bike riding, horse-riding, dispersed camping, hunting, fishing, canoeing, car rallies, nature study, fossicking and prospecting.	Walking, dispersed camping, nature-study, hunting, fishing, canoeing, four-wheel-driving and trail-bike remote touring.
Settings	Management influence is obvious. Interaction between users is moderate to high.	Management influence is obvious, though largely in harmony with the environment. Interaction between users is often moderate to high.	Natural settings with some modifications present but not dominant. Virtually no facilities. Interaction between users is low to moderate.	Areas are essentially unmodified environments with little obvious management influence. Interaction between users is low to very low.
Experience	High probability of large numbers of users on-site and in nearby areas.	Moderate probability of encountering other users, but with a high degree of interaction with the natural environment.	High to moderate probability of experiencing isolation from the sights and sounds of humans. Areas offer some degree of challenge and self-reliance.	High probability of experiencing isolation from the sights and sounds of humans. Higher degree of challenge and self-reliance.

Note: The list of activities for each zone is not exhaustive but is intended to indicate where activities are likely to be best catered for.

NRE will promote opportunities for those recreational activities that are best suited to each zone. For intensively used areas , such as the forests adjacent to Beechworth and Yackandandah, opportunities for picnics, scenic drives, limited camping and short walks are suitable. In areas where visitors seek more remote recreational opportunities, such as the foothill and mountainous forests out of Mansfield, Bright and Corryong, activities including horse-riding, bushwalking, hunting, four wheel driving and camping are more suited and minimal facilities are required. Table 7.2 indicates the suitability of RMZs for various recreational activities and Table 7.4 indicates the types of facilities appropriate to the respective RMZs.

Table 7.2 Suitability of recreational activities in Recreation Management Zones[1]

Activity	Zone 1	Zone 2	Zone 3	Zone 4
Picnicking	***	**	*	*
Short walks	***	**	*	*
Extended walks	*	***	**	**
Camping	**	***	***	***
Horse-riding	***	***	***	***
Fishing	***	***	***	***
Hunting	*	**	***	***
Two-wheel driving	***	***	**	*
Four-wheel driving	*	**	***	***
Trail-bike riding	*	***	***	***
Mountain-bike riding	**	***	***	***
Car rallies	*	***	***	*
Rogaining and orienteering	***	***	***	***
Canoeing and rafting	*	***	***	***
Rock climbing	***	***	***	***
Fossicking and prospecting	*	**	***	***

Notes:

1. This table is to be used as a guide only. NRE does not intend to establish any specific restrictions on non-commercial activities in any zone.
2. *** high suitability, ** moderate suitability, * low suitability.

7.3 MANAGEMENT OF RECREATION ACTIVITIES AND FACILITIES

Recreation Activities

A diverse range of forest environments extending from the foothills to remote mountainous locations, extensive kilometres of forest roads and tracks, and the provision of recreation facilities all contribute to making the North East a popular destination for forest recreation. Many of the popular locations are within the national parks of the region. NRE seeks to complement the recreation opportunities and facilities of the parks system by providing for a range of recreation activities. As a general strategy, NRE intends to focus resources for recreation facilities, which may lead to the provision of fewer sites of higher standards.

Visitors pursue a wide range of nature-based recreation activities including picnicking, pleasure driving, four wheel driving, trail bike riding, bush-walking, camping, cycling (road and mountain bikes), hang gliding and para-gliding, orienteering and rogaining, fishing, hunting, horse riding, white-water rafting and kayaking, canoeing, fossicking and prospecting. The forests also offer opportunities for historical and environmental education.

Ensuring that these pursuits occur in an environmentally sustainable manner is a high priority for forest management. In doing so, NRE provides a valuable community service, contributes to regional tourism and helps to protect the forest from impacts of visitor use.

Horse riding and four wheel driving activities are popular recreational pursuits in the forest areas of the North East. In some places, particularly around Mansfield, forest areas experience a high level of use that is anticipated to increase in the future. Management is required to prevent over-use of popular routes and to maintain a quality forest experience. Horse riding and four wheel drive touring are recreation activities identified for special focus in this Plan and are discussed in more detail later in this chapter.

Recreation user groups can make a significant contribution to recreation management in State forests. Groups already assist with hut maintenance, rubbish collection and track maintenance. NRE is seeking to develop partnerships with community and user groups to encourage this type of participation.

Voluntary codes of practice have been developed by NRE and other land management and environmental agencies for a range of popular activities including horse-riding, four wheel drive touring, bush-camping, trail-bike riding, mountain-bike riding and bushwalking. While some of these refer to activities in particular conservation reserves, they have a general application and serve as a useful guide to users of the North East forests. The Codes are available from NRE and Parks Victoria information centres and offices throughout the region.

Aim

Provide forest visitors with:

- ***a diverse range of forest recreation settings;***
- ***access and opportunity for all forest recreation activities that are consistent with the other objectives of this Plan;***
- ***facilities at selected locations to enhance enjoyment of forest environments, and to provide a focus for forest recreation activities;***
- ***information to assist understanding of forest recreation opportunities, the forest environment and management; and***
- ***opportunities, activities and facilities that complement those provided by the parks and reserves system.***

Management Guideline

Recreation activities

Opportunities should be provided for appropriate recreation activities in State forest including activities that are excluded or restricted in Parks and reserves (e.g. hunting, dogs accompanying visitors and large-scale organised recreation events).

Planning, management and delivery of recreation programs should be guided by Recreation Management Zones and coordinated between State forests and Parks and reserves to ensure diverse forest recreation opportunities are maintained and to assist in separating conflicting uses.

Regular liaison with major community based recreation groups should be maintained and recreation activity codes of practice promoted via these groups.

Commercial recreation activities should be facilitated where the activity is consistent with other forest management objectives. Licensed tour permits should address the need to protect environmental values and to minimise the impact of large groups on other users.

NRE should work with organisers of commercial or large-scale events to ensure adequate measures are taken to protect environmental values, assisted by the use of a permit system.

Recreation activities which are incompatible with other State forest values or uses, or which are not forest-dependent, should be discouraged through community education or, where necessary, regulations.

Horse riding

Horse riding is very popular in the North East and is undertaken both by recreational riders and those involved in commercial horse riding tours. There are currently 23 licensed operators offering horse riding tours and one offering camel riding tours. Licensed tour permits specify conditions including: the area in which the operator can conduct tours, the maximum number of horses (limited to a maximum of 20 in State forest areas), feed requirements, camping, use of horse yards and environmental considerations. Recreational riders may vary from a single individual through to club rides and competitive events such as 24 hour endurance time trials involving many horses. Competitive events such as these usually require a permit.

The most popular horse riding area in the North East is around Mansfield, where high country rides often include State forest, Alpine Resorts and Alpine National Park. Elsewhere, State forest is used to gain access to the popular horse rides on the Bogong High Plains (within the Alpine National Park) in summer. State forest around Corryong is most heavily used by horse riders during the popular 'Man from Snowy River Festival' in mid-April. Areas including the Toombullup Ranges, Strathbogie Ranges and Stanley State forest are used at moderate to low intensity throughout the year due to their proximity to population centres. Generally, horse riding activities (other than day rides) occur within RMZs 3 and 4, as these areas are more remote and provide the desired experiences of riders.

Horse riders require few facilities. They ride on vehicle tracks and bridle trails, or cross-country. If camping, they require either permanent horse yards or a temporary means of restraining horses overnight. Existing horse yards are managed to make them available to all riders, on a 'first come, first served' basis. Unless licence conditions stipulate otherwise, neither private or commercial groups do not have a prior right to horse yards. Licensed graziers may be authorised to construct yards, and these yards will be available to other riders when not required for licensed grazing purposes.

Currently, the number of licensed horse riding operators in the Mansfield area (14 horse riding and one camel riding operator) has lead to a high intensity of use over parts of State forest. At this stage, the level of use can be accommodated, however, any increase in the intensity of use may necessitate a review of licensed horse riding activities. This may require additional regulation or changes to the current permit conditions in order to ensure a high quality recreation experience and avoid overuse or unacceptable environmental damage.

NRE encourages horse riding activities in RMZs 3 and 4 and promotes the *Horse Riding Code* (CNR 1993b) that is equally applicable to horse riding in State forest. The *Horse Riding Code* promotes environmentally sensitive riding practices.

The following Guidelines and Actions are equally applicable to horse and camel riders and would apply to other animals not currently ridden in State forest.

Management Guideline
Horse riding

Horse riding activities should be conducted in accordance with the *Horse Riding Code*.

Horse riding activities and any development of associated facilities in State forest should be guided by the Recreation Management Zone guidelines.

Licensed horse riding activities should be managed in accordance with the Licensed Tour Permit System. Unless licence conditions stipulate otherwise, horse riding groups should not exceed 20 horses. Large groups may be confined to forest road networks as a condition of the permit, to minimise impact.

In general, horse riding groups including spare horses, pack horses and horses in training should not exceed 20 horses. However, in some circumstances, such as where the majority of the ride will take place in Alpine National Park Conservation B Zone, up to 28 horses may be permitted.

Non-commercial competitive or organised events that include more than 20 horses should be managed using the NRE permit system for organised events.

State forest may be used for horse-riding all year round, excluding the following areas:

- Reference Areas;
- defined camping areas and day-visitor areas, other than those with constructed horse yards; and
- walking tracks (unless otherwise designated).

ACTIONS

Facilitate horse riding activities guided by the Recreation Management Zones, and in accordance with the Guidelines for Horse Riding.

Monitor environmental damage, and where necessary, temporarily close or rehabilitate damaged tracks or limit the number of riders. Undertake track maintenance where required.

Maintain regular liaison with peak horse rider organisations and licensed operators concerning horse riding issues.

Liaise with other land managers including Parks Victoria and Mount Stirling and Mount Buller Alpine Resort Management Boards to encourage uniform guidelines and requirements relating to horse riding on public land.

Four wheel drive touring

Four wheel driving is a common recreation activity, widely pursued across the North East public land road and track network. The more remote and mountainous areas of the Alpine National Park and surrounding State forest are the most popular locations. Popularity for this activity has increased steadily over recent years and it is now common to see four wheel drive clubs in the high country from November to June. The purpose of four wheel driving may be to enjoy touring and sightseeing, to reach campsites, to hunt deer or to fish in remote streams.

Good opportunities for four wheel driving are generally found in RMZs 3 and 4, however, the road network as a whole is available for vehicle-based recreation. Appendix R outlines two wheel and four wheel drive touring routes that are promoted.

During the preparation of this Plan, the road network was reviewed in consultation with the Victorian Association of Four Wheel Drive Clubs. Consequently, there will be some rationalisation of the road network and a number of tracks not required will be closed. Reasons for closure include: tracks that duplicate access, tracks requiring extensive maintenance to meet acceptable standards, temporary timber harvesting access tracks and tracks causing unacceptable environmental impacts. Refer to Chapter 10 – *Forest Roads* for more information about the road network.

NRE in conjunction with the Victorian Association of Four Wheel Drive Clubs promotes the voluntary *4WD Touring Code* (CNR 1995a).

ACTIONS

Maintain access to a network of four wheel drive routes within State forest and where possible, maintain links with tracks in National Parks and reserves.

Continue liaison with peak four wheel drive groups regarding four wheel drive issues.

Deer Hunting

Deer hunting is a pursuit that occurs throughout much of State forest in the North East, particularly during the winter months. Sambar deer occur across the Alpine region shared by the North East, Gippsland and Central Highlands. The largest Sambar deer populations occur in Gippsland. However, in the North East, the upper Jamieson River area and the area bounded by the Great Dividing Range, the upper Wonnangatta River and the Teatree Range are popular for hunting. Hunting of Sambar deer is permitted in parts of the Alpine National Park and in State forest (except where restrictions apply).

In July 2000, Wildlife (Game) (Deer Amendment) Regulations 2000 were proposed which included an aim to improve the management of Sambar Deer hunting with scent-trailing hounds and reduce the illegal spotlighting of game deer in Victoria. These regulations are expected to minimise conflicts and reduce illegal activities, while continuing to provide hound hunting opportunities in Victoria. The Regulations also provide for the introduction of a hunting season for Fallow Deer, allowing for the sustainable management of the population in the Municipality of Towong (the Upper Murray area), and to provide a hunting opportunity which may assist with the reduction of other illegally established free-ranging Fallow Deer populations.

Deer hunting in the North East is generally pursued in the more remote areas of State forest, usually in RMZ3 and RMZ4 category land.

ACTIONS

Encourage the development of a voluntary code for deer hunting activity on public land with reference to use of dogs, camp site maintenance and firearm safety.

Liaise with the peak user group (Australian Deer Association) on deer management issues.

Organised and competitive events

Examples of organised events include music and cultural festivals, potentially involving up to several hundred people. A smaller scale organised event may be, for example, a wedding in a forest setting. Organised events are conducted under a permit issued by NRE and subject to a series of conditions. The use of State forest by Aboriginal communities for traditional or cultural purposes does not require a permit.

Competitive events include car rallies run by groups belonging to the Confederation of Australian Motor Sport (CAMS), motor cycle enduros, orienteering and rogaining championships, hang gliding and para-gliding championships, mountain bike races and horse endurance rides. The NRE policy *'Car rallies on public land'* provides comprehensive detail of procedures relevant to CAMS and other vehicle events. Applications to hold other events are treated on an individual basis in accordance with relevant NRE policy guidelines.

Permit conditions for events include fire precautions, environmental care, parking and traffic routes, public liability insurance and indemnity to NRE, notification of other relevant authorities, gaining of other required permits, litter, toilet facilities and safety of the general public on forest roads during competitive events.

Management Guideline

Organised and competitive events

Organised and competitive events should be issued with a permit that authorises the proposed activity and provides conditions appropriate to the nature and scale of event. Conditions should include environmental, fire prevention, safety provisions and may also require payment of a security bond and/or event fee.

Existing policies for organised events and CAMS car rallies will guide the approval process.

Licensed tours

A number of organisations provide recreation services on a commercial basis, thus contributing to rural small business opportunities, employment and sustainable regional development initiatives. These tours often provide access to forest recreation activities which may be unavailable to tour participants using their own resources. Licensed tour operators are required to obtain a *Licensed Tour Operators Permit* (the Licensed Tour Permits system is applicable across all public land – including both parks and State forests). This provides an opportunity for NRE to develop appropriate conditions to ensure the activity is consistent with other forest management objectives. A list of licensed tour operators and activities in the North East is presented in Table 7.3.

Table 7.3 Licensed tour activities and operator numbers in the North East

Licensed tour activity in North East Victoria State forest	No. of operators offering activity[1,2]
Four wheel drive tours	28
Trail bike and motor bike tours	4
Bus and vehicle tours	2
Horse tours[3]	23
Horse-drawn wagon tours	1
Camel tours	1
Deer hunting tours	1
Fishing/fly fishing/fishing/camping tours	4
Rafting, canoeing and kayaking	13
Cycling, including mountain bike	10
Bushwalking tours	16
Cross country skiing	8
Rock climbing and abseiling	5
Nature tours	5
Bird watching	1
Hang gliding	1
Aboriginal heritage tours	1
Team building	1
Fossicking and gold panning	1
Total of activities	**127**
Total number of operators	**85**

Notes:
1. The number of operators is current as at 30 June 1998.
2. Some operators hold a licensed licence for more than one activity.
3. Of the 23 horse riding operators using State forest, 14 operate in the Mansfield area, as does the camel tour operator.

Management Guideline

Licensed tour activities

Licensed tour activities should be guided by the Recreation Management Zones, and in accordance with the Guidelines for Horse Riding, 4WD use and various other voluntary codes of practice which may apply to tour operators.

Liaison with other land managers including Parks Victoria should be maintained to encourage development of uniform guidelines and requirements relating to licensed tour activities on public land.

Address potential conflicts between licensed tour operators and other forest uses through forward planning.

ACTIONS

Establish effective liaison between licensed tour operators and forest management staff regarding licensed tour issues.

Monitor environmental damage and, where necessary, temporarily close or rehabilitate damaged sites and limit the number of horse rider, 4WD or other groups.

Recreation facilities

State forest recreation facilities are located throughout the North East. Generally found close to popular tourist towns, waterways and viewing spots, these facilities complement those provided by other public land managers. Coordination of the location and nature of State forest facilities with other recreation facility providers is an important part of State forest recreation management. This plan intends to provide sufficient recreation facilities in State forest to meet current demand and likely growth in demand over the next 10 years.

NRE's challenge is to balance user demand for well-located and well-maintained sites with the provision of opportunities for visitors interested in a wide range of recreational pursuits, while achieving high standards of design and maintenance. There is a need to improve maintenance and promote existing sites to visitors to the region, rather than construct additional sites.

The nature, location and quality of visitor facilities can influence the enjoyment of State forest recreational visitors. Overcrowded, dilapidated or poorly located sites can detract from a recreation experience, and are prone to vandalism.

NRE manages State forest to provide visitors with a broad range of opportunities for recreation experiences. At a number of sites, NRE will continue to provide and maintain traditional recreation facilities. In RMZs 1 and 2, the facilities will reflect a diversity of recreation activities and a high intensity of use. In RMZs 3 and 4, where facilities are provided, they will reflect the values of a remote recreation experience. At most sites in RMZs 3 and 4, visitors should be self-sufficient (refer to Table 7.4).

Recreation facilities in State forest serve a number of roles. They can add to visitor enjoyment through the provision of facilities such as fireplaces, toilets and picnic tables and by providing a focus for recreation activities such as a starting and finishing point for bushwalking. They also assist recreation management by confining activities such as camping to sites capable of supporting use, and by providing a focus for the distribution of visitor information.

The focus for State forest recreation planning in the North East is to provide a satisfying recreation experience to visitors and to provide a range of facilities at popular recreation sites which have two wheel drive access. New or replacement facilities installed in State forest should generally be designed to be physically accessible to the widest range of people possible. Where possible, consistent with the management objectives of the site, disabled access should be provided. A listing of existing recreation facilities and their management is found in Appendix S, while Appendix T identifies priority works relating to recreation and tourism activities in the North East.

Where scenic and educational Forest Drives are promoted they may incorporate:

- a description of State forest management strategies for biodiversity conservation, sustainable wood production and other management features;
- interpretation of scenic and historic features;
- explanation of current forest management activities such as timber harvesting, thinning and fuel reduction burning; and
- information on the location of existing recreation facilities and interpretive facilities.

Table 7.4 Provision of recreation facilities and services in Recreation Management Zones

Type of recreation facility	Zone 1	Zone 2	Zone 3	Zone 4
Camping sites	✓	✓	✓	
Licensed tours	✓	✓	✓	✓
Walking tracks	✓	✓	✓	
Fire places	✓	✓	✓	
Forest drives	✓	✓		
Horse riding facilities	✓*	✓	✓	
Information/Interpretation	✓	✓		
Picnic tables/Toilets	✓	✓		

Note: NRE will use this table to guide the standard and development of facilities in each zone. The actual type of facility provided in a particular site will vary according to the RMZ, the location of the site and current and anticipated future usage.
* Appropriate in certain locations.

Management Guideline
Recreation facility management

Existing facilities and proposed facilities should be consistent with the RMZ guidelines and NRE's capacity to maintain facilities to a high standard while meeting environmental values.

New facilities should be established where appropriate and the impact of facilities should be considered prior to their establishment. Facilities should be developed to blend into the natural forest surroundings and to enhance the forest recreation experience.

Recreation sites should be regularly assessed to determine if replacement, repair or removal of damaged facilities is required, or unacceptable environmental impacts are occurring as a result of use or design of the site.

Forest drives should be regularly reviewed to ensure they remain enjoyable, relevant and up to date.

ACTIONS

Manage State forest recreation activities in accordance with the Guidelines for the Management of Recreation Activities.

Maintain the existing forest drives and network of walking tracks (listed in Appendix S).

Upgrade and maintain recreation facilities as outlined in Appendix S and T.

Where feasible, design and construct new or upgraded visitor facilities to provide access for disabled visitors, consistent with the overall objectives of the site.

Monitor the use and condition of sites as a basis for maintenance and upgrading programs.

Australian Alps Walking Track

The Australian Alps Walking Track (AAWT) extends from Walhalla to Canberra, covering approximately 650 km. Within eastern Victoria the AAWT mainly travels through the Alpine National Park, however there are two sections in State forest; one between Mt Sunday and Mt McDonald, and another on Long Spur (near Mt Wills). The AAWT is managed by the local land management agency with coordination being provided by the Australian Alps Liaison Committee through strategy documents and a working group. The working group includes land managers and track user representatives. The management strategy for the AAWT was completed in 1997.

NRE recognises the significance of the AAWT, and will contribute to the maintenance of the track consistent with LCC recommendations (LCC 1983) and the AAWT Management Strategy.

Management Guideline
Australian Alps Walking Track

Maintain a visual corridor generally of 50 metres either side of the AAWT, free from harvesting and other activities, where practicable, in order to maintain the landscape quality of the AAWT.

Manage the track in accordance with the AAWT Management Strategy, which includes guidelines on signage and track marking, and the procedure for changing the agreed route.

Co-operate with Parks Victoria to maintain the AAWT at an appropriate standard, taking into account both its significance and level of use in sections where it does not follow a vehicle track.

Construct and maintain NRE roads that cross the AAWT in a manner that considers the needs of walkers using the track.

Consider the use of alternative extraction routes during harvesting operations to protect the AAWT where that section is a vehicular track managed by NRE.

7.4 HUTS

There are 33 huts in the State forest planning area. This number excludes huts in Historic Areas, hut ruins or sites of former huts. The huts vary in age, style, construction and condition. Most were originally constructed to shelter people involved in timber harvesting or grazing activities, although others had their origin in recreation, mining, or road maintenance. The huts are open to the public, and while visitation to Craig Hut in the Mansfield area is very high due to its association with the movie ‘The Man from Snowy River’, most other huts have low visitor levels. Map 4 shows the location of huts and Appendix U describes their management.

It is intended that huts will be retained where they have heritage value or provide for emergency refuge. A number of huts have regional or state heritage values. Six hut sites are considered to have historic significance at a Regional level and four huts have been nominated or listed for the Register of the National Estate or the Victorian Heritage Register because of their heritage value.

Given the large number of huts in State forests of the North East, it was recognised that the maintenance required to keep the huts in good condition could be significant. During the preparation of this Plan, NRE called for expressions of interest to determine community interest levels in assisting NRE retain and maintain the huts. The community response was very positive and consequently, this Plan proposes that some of the huts be maintained by arrangement with volunteer groups, either as an on-going arrangement or a short-term project.

Some huts have fallen into disrepair. Where they are considered unsafe, of little heritage value or not required for shelter purposes, they will be removed. If a hut is damaged or destroyed by fire or another cause, it may not be replaced.

All huts on State forest are the property of the Crown (Victorian Government) regardless of who built them. Generally huts are available to the public on a 'first come, first served' basis for shelter or refuge only. The huts are not for accommodation purposes and as such, visitors should be self-reliant. In some cases, a grazier (in accordance with the grazing licence) may have a prior right of use to a hut. In the North East, a small number of huts are licensed to a private individual or group, however, these huts are not located in State forest.

Aims

- ***Provide public access to all huts for refuge and shelter purposes. Ensure that the use of huts and their surrounds has minimal impact on the environment.***
- ***Preserve and protect historic huts.***

Management Guideline

Huts

All huts on State forest should be managed to provide for public refuge and shelter, on a 'first come, first served' basis. Huts are not intended for or equipped to provide accommodation. Users will be encouraged to share huts.

Historic huts classified as being of high significance will be preserved. Huts should not be altered or removed until historic significance has been determined or they are considered by NRE to be unsafe.

Huts maintained by volunteers in agreement with NRE should have hut maintenance plans prepared prior to any work commencing. Plans will include as a minimum; the required standard of maintenance, any heritage values to be protected or maintained and safety considerations.

Where volunteer groups maintain huts on behalf of NRE, the agreement will not give a prior right of use to the hut but the contribution made by the volunteers will be acknowledged by providing appropriate information inside the hut.

Proposals for alterations or additions to any hut should be assessed in accordance with hut maintenance plans and be consistent with the purpose of huts, management objectives of the area, and historic, cultural and environmental values. Where exotic plants may be associated with an historic hut, any proposal for removal should consider their cultural significance.

Huts without significant historical or refuge values will be removed unless user groups or volunteers can justify the need for retention of huts and can contribute to their upkeep.

Construction of a new hut or a replacement hut may be permitted only in circumstances where a public need for refuge or shelter can be demonstrated. In general, huts constructed without NRE approval will be removed as soon as practicable.

Visitors to huts will be encouraged to take their rubbish home with them.

CRAIG HUT AND SURROUNDS

Craig Hut is a popular site, attracting an estimated 30 000 visitors per year (VicRFASC 1998a). Given the high intensity of use, guidelines and prescriptions specific to the location (Appendix U) have been developed in order to protect the area from visitor impacts.

ACTIONS

Manage huts in State forest in accordance with the Guidelines for the Management of huts and as described in Appendix U.

Ensure all huts maintained in State forest are available for public refuge and shelter.

Monitor the condition of huts and their surrounds for environmental impacts and take appropriate remedial action.

Facilitate joint NRE-volunteer groups hut maintenance arrangements according to agreed hut maintenance plans.

Chapter 8
CULTURAL HERITAGE, NATIVE TITLE AND LANDSCAPE

The forests of the North East have a rich human history. Aboriginal people long occupied the land before it was exploited, first by graziers, and then miners and timber-getters during the mid to late 1800s. Recognition of the continuing importance of land to Aboriginal people, and protection of Aboriginal places and the historic relics of the pastoral, timber-getting and mining days are important goals of forest management.

Forested landscapes of the North East are a primary attraction to both residents and visitors to the area. Forest activities need careful management to protect landscape qualities and minimise impacts.

8.1 CULTURAL HERITAGE

Public and private land in North East Victoria contains evidence of past human use. In State forests, this evidence includes sites of Aboriginal occupation and numerous sites demonstrating recent history. These include sites associated with European exploration and settlement, pastoral occupation, mining, timber harvesting, transportation, forest work camps and sites associated with significant people, events and communities. There is also a long history of Chinese involvement in mining and settlement in the North East. Some of this evidence of the past has been destroyed by more recent human interference or by fires, or overgrown with vegetation.

Places of traditional significance for Aboriginal people and other areas highly valued for their aesthetic, historical, social or landscape values form part of our cultural heritage.

Aims

- ***Protect and maintain the cultural and historic values of the North East forests.***
- ***Encourage sensitive use of selected historic places for the education and enjoyment of the public.***

Aboriginal places

Aboriginal places include areas of traditional and continuing significance to Aboriginal communities and sites with material evidence of Aboriginal occupation and use. There are few recorded sites on State forest in the planning area, however, forest activities such as timber harvesting and road construction have the potential to damage yet-undiscovered sites. A comprehensive survey of Aboriginal places on State forest has not been undertaken and some sites may only become evident when the vegetation or soil surface is disturbed.

Aboriginal sites are recognised for their cultural, scientific and educational values. Local Aboriginal communities are the primary custodians of sites and Aboriginal Affairs Victoria (AAV) (a division of NRE), is the State government agency responsible for site identification and recording. All Aboriginal places, whether recorded or not, are protected under the Victorian *Archaeological and Aboriginal Relics Preservation Act* 1972 and the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 (ATSIHP Act). The same legislation requires that the protection of Aboriginal places be in consultation with Aboriginal communities with an interest in the place.

Aboriginal organisations nominated for consultation concerning the protection of Aboriginal cultural sites in the North East under the ATSIHP Act are:

- Shepparton Aboriginal Arts Council Cooperative Ltd;
- Camp Jungai Cooperative Ltd;
- Wurundjeri Tribe Compensation Cultural Heritage Council Inc. (small portion of planning area);
- Gippsland and East Gippsland Aboriginal Cooperative Ltd. (small portion of planning area); and
- Moogji Aboriginal Cooperative (small portion of planning area).

The North East Regional Forest Agreement provides for the development of a package of measures to ensure the appropriate management of Aboriginal heritage including the maintenance of traditional historic uses and values. These measures are to: develop statewide guidelines for the management of cultural heritage values; provide for participation and negotiation through the establishment of formal consultation mechanisms with local Aboriginal communities; undertake modelling to establish priority areas for future surveys of Aboriginal sites; and provide cross-cultural training for staff (VicRFASC 1999).

NRE is developing an aboriginal heritage management system in consultation with Environment Australia and Aboriginal communities to implement the above measures, and to ensure that processes are in place for the on-going identification, assessment and protection of Aboriginal heritage values. Hughes and Buckley (2000), in consultation with Aboriginal communities, developed a sensitivity zoning plan for the North East region based on a predictive modelling approach to assist in the management of sensitive archaeological areas.

A range of cultural heritage programs operate across Victoria. A Regional Cultural Heritage Program has established five regional bodies that act as resource agencies in cultural heritage matters within their particular region of the State. The bodies responsible for the planning area are the Kulin Nations, and the North East Cultural Heritage Program. One of the roles of the Regional Cultural Heritage Program is to ensure that all appropriate people are consulted and involved in decision-making.

The Dhudoroa, Taungurung, Wurundjeri and Jaitmathang people have on-going connections with the land in North East Victoria. On-going consultation with these people should provide the opportunity for input into forest management.

ACTIONS

Develop and implement the measures identified in the North East Regional Forest Agreement to facilitate the appropriate management of Aboriginal heritage values.

Apply the statewide cultural heritage guidelines in the North East once developed

Maintain liaison with local Aboriginal communities and NRE's AAV division to facilitate information sharing and to provide opportunities for input into forest management decisions and activities.

Encourage Aboriginal community participation and employment in forest management activities.

Determine management requirements for sites in consultation with local Aboriginal communities.

Incorporate measures to protect Aboriginal sites into the Native Forest Harvesting Prescriptions.

Increase cross-cultural awareness among NRE forests staff through training involving relevant Aboriginal communities.

Historic places

A number of studies have been undertaken to document and assess the historic places in North East Victoria. These have occurred:

- as part of the on-going management data collection process of NRE;
- through a joint project between NRE and the Australian Heritage Commission to identify historic mining sites;
- as part of data collection for disturbance influences in the jointly funded state and federal government old-growth forest project; and
- through special studies initiated under the Regional Forest Agreement (RFA) process.

Local historians and NRE staff have also provided locations of historic sites.

Almost 200 historic sites ranging in importance from local to state significance, have been recorded in State forest in the North East (see Appendix V). A number of sites are either listed or nominated for listing on the Register of the National Estate or the Victorian Heritage Register. Additional sites may be discovered in the course of forest management activities or as the result of further research. These will be assessed and the significant sites protected. The major emphasis will be to protect significant historic sites from human disturbance and inappropriate development and to establish a process for their long-term management.

Historic places in State forest are managed in accordance with the principles of the Burra Charter (International Council on Monuments and Sites). Basic principles inherent in the Charter include: acknowledging the importance of a place itself; understanding its cultural significance; recognising that the fabric, setting and contents of the place are important; making decisions about the future of the place based on information methodically collected and analysed; and keeping accurate records about decisions and changes to places. The most significant or representative sites in State forest are placed in Special Protection Zones (SPZ) or Special Management Zones (SMZ).

Management actions for each site are documented in Appendix V. Most sites either have a management action or buffer nominated to assist in their protection. Where a buffer is specified, timber harvesting, machine movement or other disturbances are excluded within the buffer. Where ‘protect historic fabric’ is recommended, any historic artefact should be left *in situ* and forest management activities should not disturb the historic features of the site.

A few sites, designated as ‘landscape’ features, include disturbed mining landscapes such as sluiced gullies, cliffs, open cuts or adits created by human activity, that cover a relatively large area. These sites require careful planning if any potential disturbance is proposed.

Selected sites that provide an understanding of the history of the area may be used in recreation and interpretation programs.

Management Guideline

Historic places

Forest management activities should be planned so that they do not impinge on the fabric of significant sites. Consultation with NRE's Historic Places Section should occur where proposed forest management activities may disturb historic sites listed in Appendix V, or where new sites are found. Consultation with Heritage Victoria should occur where proposed forest management activities may disturb sites on the Victorian Heritage Register.

Measures to protect historic sites may include:

- limitations on heavy machinery movement to specified crossing points;
- removal of vegetation that may cause damage to the site;
- improving drainage around a site; and
- placement of a SPZ or SMZ around the site, based on its significance and susceptibility to loss or damage; or
- erection of signs explaining the reasons for leaving artefacts on the site and penalties for removal.

Management plans for historic sites or themes should be progressively developed for the most significant and vulnerable sites.

Sites used for education and interpretation should be:

- accessible;
- close to current recreation facilities or a grouping of sites illustrating a theme (or themes) of forest activity; and
- robust to disturbance so that integrity of the place is maintained.

ACTIONS

Incorporate measures to protect historic sites into the forest management prescriptions.

Ensure that proposed activities do not adversely affect historic places, in line with the guidelines above, through review of and input to annual operational plans such as the Wood Utilisation and Fire Operations Plans.

Manage sites according to the Guidelines for the Management of Historic Places and the recommendations in Appendix V.

8.2 NATIVE TITLE

The *Native Title Act* 1993 (NTA) recognises and protects native title and regulates activities that may affect native title. Indigenous people can apply to have native title rights on Crown lands and waters in their traditional lands, recognised by Australian law by applying for a determination of native title with the Federal Court. The NTA enables native title holders to negotiate over matters that may affect their native title rights and interests before they formally receive recognition.

There are currently 4 Native Title Applications over public land including State forest in the North East planning area. These are:

- Yorta Yorta Aboriginal Community (reference VG6001/95)
- Dhudoroa #2 (reference VG6024/98)
- Gunai/Kurnai People (reference VG6007/98)
- Taungerong People (Reference VG6021/98)

The Yorta Yorta claim in northern Victoria was determined in December 1998. It was found that no native title existed in the claim area. However, this decision is currently subject to an appeal to the full bench of the Federal Court.

All proposals on State forest must be assessed in light of the future act provisions of the NTA. This must occur, regardless of whether there is a native title claim lodged over the forest. This consideration may give rise to procedural rights, such as the right to comment on a proposal, to the relevant native title parties. The future act provisions only apply if native title has not been extinguished. Native title may have been extinguished by former freehold or leasehold land and public works. If there is no extinguishment and the proposal does not fit within the future act provisions of the NTA, the proposal will not be valid unless an Indigenous Land Use Agreement (ILUA) is entered into.

An ILUA gives the claimants a "right to negotiate" over matters which may affect their rights without the prior requirement of formal recognition of native title.

This Plan is not an ILUA and is not intended to pre-empt the development of an ILUA. The Plan may, however, assist in future consultative processes with Aboriginal people and communities interested in the management of the North East forests.

ACTION

Ensure all future acts undertaken within State forests are done so in accordance with the provisions of the* Native Title Act *1993.

8.3 LANDSCAPE

The scenic quality of North East Victoria is an important attribute recognised by local residents and tourists alike. Images in tourism promotions include the snowfields, hills, mountains, streams and agricultural land uses such as vineyards.

The natural landscapes of the North East comprise part of the region's attractiveness to tourists and contribute economic benefits to the area. NRE is responsible for managing a large proportion of the natural landscape and endeavours to protect landscapes of high scenic quality and viewer interest.

Aims

- ***To protect landscape values, especially areas of greatest scenic and aesthetic quality and viewer interest.***
- ***Minimise the visual impact of forest management activities on the landscape.***

Management actions can impact on the landscape viewed by visitors to an area, and what they see may strongly influence their perceptions of native forest management. If not managed properly, roading and

logging can have a major impact on the forested landscape, particularly when viewed in the near and middle ground. Careful design of these activities can minimise impacts.

Landscape management on public land is guided by the Visual Management System (VMS) (Williamson and Calder 1979). This uses a combination of scenic quality, visitor sensitivity and distance classes to set visual quality objectives for an area. The VMS can be used for detailed landscape planning, or to develop broader landscape management strategies.

Management Guideline

Landscape values

All landscapes considered to have high sensitivity and high scenic quality should be included as part of the Special Management Zone (SMZ).

In areas of high sensitivity and high scenic quality, timber harvesting coupes and new road alignments or easements should be modified to ensure that the scenic value is maintained.

Landscape alterations in the middle ground may be evident in the short term, but become less apparent over time. Timber harvesting coupes, new roads and easements in these areas should be designed to minimise their visual impact.

The following strategies will help protect areas of high sensitivity and high scenic quality:

- selective harvesting around the edges of timber harvesting coupes;
- using silvicultural regimes such as overwood retention or selective harvesting;
- minimising the width of road alignment clearing;
- restricting the area of timber harvesting coupes which can be seen from popular travel routes or towns;
- curved boundaries of timber harvesting coupes; and
- ensuring the spatial and temporal distribution of timber harvesting coupes.

The actual strategies adopted should be specified in Coupe Plans prior to harvesting.

Landscapes with high scenic value are listed in Appendix W. These have been identified from a variety of sources, including RFA workshops involving a cross-section of the public and NRE staff.

Some of the landscapes considered in Appendix W have been listed as Classified or Recorded Landscapes by the National Trust. Other landscapes considered in Appendix W have been nominated for the Register of the National Estate, however, assessment has not been completed for a number of these areas.

Appendix W lists areas of high scenic quality and their management. These areas include the vegetation adjacent to popular travel routes and areas seen from some roads, rivers, towns and lookouts. Timber harvesting will be permitted in the majority of these areas but special attention will be given to landscape values. Alterations to the foreground landscape of these areas should be temporary, subtle and not evident to the casual observer.

A number of places within the North East have been identified as having aesthetic value (VicRFASC 1998b). The aesthetic value was defined as '*the response derived from the experience of the environment or particular natural and cultural attributes within it'*. Aesthetic value takes into account people's perception of form, scale, colour, texture and material, smell and sound. Appendix W also lists the sites identified by the RFA consultants as containing aesthetic value and their management.

In addition, the Land Conservation Council (LCC) recommended areas of State forest to be protected for their natural features and landscape values (LCC 1983; LCC 1991b; LCC 1994), while the National Trust has classified or recorded the cultural, scientific and aesthetic quality of areas in the North East. These areas and their management are also included in Appendix W.

ACTION

Manage the high scenic quality landscapes seen from major tourist roads, towns and viewing points according to Appendix W and the above Management Guideline for Landscape values.

National Estate

A study conducted under the RFA process assessed national estate values in the North East and provides more detail on natural and cultural values of the region (VicRFASC 1999a).

Conservation measures for natural values identified as being sensitive to disturbance by the consultants have been developed. Such measures are encompassed in strategies for biodiversity conservation (see Chapter 3 – *Biodiversity Conservation)*. Conservation of other natural and cultural values is achieved through forest management zoning, conservation and management guidelines and actions set out throughout this Plan.

The North East RFA recognises that many of the national estate values are well reserved in the CAR reserve system and that this plan and other mechanisms provide for the conservation of many other national estate values in the region. National estate values in the North East will be conserved through the application of the principles for managing national estate values as detailed in this plan.

Mt Wills Historic Area

The Mt Wills Historic Area has a long history of mining and timber harvesting and has also been nominated as a place of natural value under the National Estate process. The same process identified the view from the Omeo Highway from Mount Wills to Granite Flat for its aesthetic value. Timber harvesting is permitted in parts of the Historic Area provided it does not conflict with recreation, education and the protection of historic integrity (LCC 1983; LCC 1991b; LCC 1994). Particular attention to landscape management in the area is required while at the same time ensuring access to timber resources.

Roadside harvesting along the Omeo Highway should be limited in extent and managed through time to protect landscape values. Landscape modification resulting in unharvested or thinned buffers along the Omeo Highway should be avoided as the high winds, heavy rain and snow of the alpine climate may lead to instability of roadside trees.

Management Guideline
Mt Wills Historic Area

In addition to the landscape values management guideline, the following strategies should assist in maintaining landscape values in the Mt Wills Historic Area:

- Harvesting operations between Bogong Saddle and Glen Wills on the Omeo Highway, should be planned to ensure that no more than 10% of the length of roadside should be less than three years old;
- Harvesting adjacent to or immediately opposite a recently logged coupe may only proceed when the regeneration of the initial harvested area is at least three years old.
- Salvage logging is permitted according to the Management Guideline for Salvage Harvesting and Regeneration (see 4.2).

Chapter 9
OTHER FOREST USES

9.1 OCCUPANCIES AND UTILITIES

State forest may be leased or licensed for a range of public and private uses. These include the construction and use of buildings for private or community purposes, rubbish tips, or the placement of utilities such as power lines, communications facilities and water or gas pipelines. There are currently a number of licences or leases for occupations and utilities issued for areas of State forest within the North East. Most licences are for a particular use and issued on an annual basis. Leases that provide for exclusive occupancy are generally issued for a longer period, with rent paid annually. All occupation licences or leases are subject to conditions, which aim to ensure that management of the occupancies is appropriate for public land.

Some occupancies or utilities in State forest serve a valuable community purpose. Telecommunications facilities such as those on the summit of Mount Big Ben and high voltage transmission lines are examples. Other occupancies or utilities include scout camps, rubbish tips and rifle ranges.

Aim

Regulate the private and institutional occupation of State forest to those uses that are dependent on access to State forest, conform to environmental standards, and provide a high level of public benefit.

Management Guideline
Occupancies and utilities

Proposals for private or institutional occupation of State forest should be considered following assessment to ensure that the proposed use:

- does not substantially conflict with conservation, timber production or recreation objectives;
- cannot feasibly be located on freehold land;
- contributes to the management of State forest;
- provides a public benefit which outweighs social or environmental cost.

ACTIONS

Assess current licences and leases, and any applications for new occupancies, to determine if they meet the Guidelines for the Management of Occupancies and Utilities.

Phase out occupancies and utilities that do not meet the above guidelines by 2005.

Where occupied sites have been substantially modified by use, and where other State forest values will not be adversely affected, explore the option of excision and sale of the occupied land.

9.2 MINERAL EXPLORATION AND MINING

The North East continues to support a range of mining and extractive activities. Much of the colonial history of the area is associated with gold mining, which was an important industry in the North East from the 1850s until the turn of the century.

The mining industry in the North East is primarily interested in exploration for and extraction of gold. Other minerals of interest include copper and feldspar. The development of new mines in the North East (such as the recently developed feldspar mine near Beechworth) may provide considerable economic benefits to the region.

Under the *Mineral Resources Development Act* 1990, access to State forest for exploration and mining requires a licence and approval of a Work Plan through Minerals and Petroleum Victoria (a division of NRE). Mining Work Plans include rehabilitation plans and are approved only after consultation with the relevant land management agency. Exploration Work Plans do not require rehabilitation plans, but are subject to a set of conditions that include rehabilitation measures. Local government planning scheme approval of mining activities is usually required except where an Environmental Effects Statement has been prepared and approved.

Exploration licences cover most of the State forest in the North East. Only a very small number of these are likely to proceed to mining operations. Exploration may involve geological mapping, ground geophysical surveys, drilling, large-scale remote sensing techniques, the removal of rock samples for testing, or the removal of bulk samples for proving mineral content. The same area may be revisited over time in the search for new minerals or using new techniques. Such activities generally have only a minor, temporary impact on forest values.

A number of small gold-mining operations exist on State forest across the North East, particularly in the Harrietville, Bright and Jamieson areas. The areas of individual mining tenements vary from less than a hectare to 37 916 ha. Currently, more than 119 510 ha of State forest are under 65 mining tenements, primarily exploration licences.

The area disturbed by mining depends largely on the type of operation. Surface alluvial operations may impact on the whole area of a tenement, whereas an underground operation may affect a smaller area over which tailings are deposited and structures placed. In practice, most of the mining operations in State forest of the North East involve small areas of disturbance in comparison to the available area under the tenement. Off-site impacts of mining potentially include sedimentation in streams, discharge of contaminated liquids and damage to forest roads by transport vehicles. Measures to address all of these risks are included in mining work authorities.

Mining and exploration are generally not permitted in areas reserved under the *National Parks Act* 1975 (operations that existed prior to the declaration of park, however, may continue) or the *Reference Area Act* 1978. Mining may occur in State forest Special Protection Zones (SPZ) subject to evaluation of environmental impacts and development of appropriate operational guidelines.

Prospecting is a predominantly recreational activity of relatively low impact in which a metal detector, hand tools, pan, or simple sluice are used in the search for gold or other metallic minerals. Prospectors are required to have a miner’s right, protect native vegetation, protect Aboriginal and archaeological sites, and to fill in any holes created and repair any disturbance. Fossicking is the equivalent procedure employed in search of gemstones.

Aims

- ***Provide for mining and exploration in State forest in accordance with the* Minerals Resources Development Act *1990.***
- ***Minimise the impact of exploration or mining activities on State forest values.***

ACTION

Seek to ensure that operational and rehabilitation requirements and approved work plans for all mining or exploration activities effectively protect forest values, including those identified in the Special Management Zone (SMZ). As a minimum, these should address:

- ***biodiversity conservation, including the measures required by the Order in Council issued under the* Flora and Fauna Guarantee Act *1988 ;***
- ***protection of catchments and streams;***
- ***impacts on forest recreation and tourism;***
- ***impacts on sawlog resources;***
- ***impacts on cultural and landscape values;***
- ***pest plant and animal control; and***
- ***management and maintenance of forest roads.***

9.3 EXTRACTIVE MATERIALS

Extraction of rock, sand, gravel, clay and soils is regulated under the *Extractive Industries Development Act* 1995 (EIDA).

NRE manages eleven minor gravel pits in the Mansfield area and Strathbogie Ranges for use in road maintenance operations.

Given the relatively small annual production and the compliance requirements of the *EIDA*, NRE intends to rationalise, progressively close and rehabilitate a number of pits in the North East. NRE intends to increasingly obtain gravel supplies from private sources.

All extractive sites in State forest including both private and NRE-managed sites, which are authorised under the EIDA, are subject to the consent of and conditions specified by the Secretary of Natural Resources and Environment through a forests occupation licence.

Extractive materials are provided on a commercial basis from several locations on private land. These sources generally meet the needs of private and government uses in the North East. State forest extractive resources are not critical to economic development of the region.

Aim

Limit State forest extractive resources activities to:

- ***the provision of material for the maintenance of forest roads and other forest management operations;***
- ***private or commercial operations only if the resource cannot feasibly be obtained from freehold land; and***
- ***sites and operations that conform to the EIDA.***

Management Guideline
Extractive activities

The opening of new NRE-managed pits and consent for other extractive activities should take into account:

- impact of proposals on State forest SPZ;
- the availability of the resource on freehold land or other sites;
- environmental and other impacts of the proposal; and
- economic values.

No new extractive activity will be permitted within the SPZ, unless it will make a significant contribution to the regional economy and unless the values within the Zone can be maintained or be provided elsewhere.

ACTIONS

Issue work authorities for extractive activities in accordance with the EIDA where appropriate and in accordance with the Guidelines for the Management of Extractive Activities and relevant legislation.

Seek to ensure operational and rehabilitation requirements and approved work plans for extractive activities effectively protect forest values, including those identified in the SMZ. As a minimum, these should address:

- ***biodiversity conservation, including the requirement of the Order-in-Council issued under the* Flora and Fauna Guarantee Act *1998;***
- ***protection of catchments and streams;***
- ***impacts on forest recreation and tourism;***
- ***impacts on sawlog resources;***
- ***impacts on cultural and landscape values;***
- ***pest plant and animal control; and***
- ***management and maintenance of forest roads.***

Ensure work plans for NRE-managed pits, where required by the EIDA, are prepared and adequately detail procedures for stockpiling of topsoil, utilisation of available material, public safety, rehabilitation works and protection of landscape values.

Progressively identify and rehabilitate redundant NRE-managed pits on the basis of their:

- ***size;***
- ***impact on soil and water values;***
- ***impact on flora and fauna values;***
- ***impact on timber values; and***
- ***hazard to visitor safety.***

9.4 GRAZING

There are 79 grazing licences in State forests within the North East covering an area of approximately 105 000 ha (15% of State forest). Of these, eight licences covering 13 800 ha are considered alpine grazing (above 1 220 m elevation). Licences are issued on an annual basis or up to seven years for seasonal bush grazing. The addition to farming income from licensed grazing on State forest in the North East is considered to be significant for those farmers holding licences (VicRFASC 1998a). Licences are subject to standard conditions developed by NRE and based on regulations made under the *Lands Act* 1958 and the *Forests Act* 1958. See Appendix X for an extract of the current grazing licence applicable to State forest.

This Plan establishes strategies for the continued use of forests for grazing purposes.

Aims

- ***Provide opportunities for grazing in currently licensed areas of State forest.***
- ***Ensure grazing licence conditions facilitate sound stock and land management practices.***

Grazing is permitted where it does not significantly compromise forest values. Commonly there are no fences in place and stock can wander widely. Licensees rely on water sources, salt licks, the road network and an end-of-season muster to manage their stock. Where grazing may impact on soils, vegetation cover, native animal and plant habitats or lead to the introduction or spread of weeds, licence conditions may restrict access temporarily or areas may be withdrawn from this use. Grazing is not permitted in Reference Areas**.**

Where SPZ exists within grazing licence areas, grazing may be excluded from SPZ or grazing strategies designed to minimise any adverse impacts may be introduced. Exclusion of grazing or the implementation of grazing strategies may be required for the protection of old-growth, rare Ecological Vegetation Classes (EVCs) and rare or threatened species. Where amendments to currently licensed areas or grazing strategies are required in order to protect environmental values, licensees will be consulted. Table 9.1 indicates rare EVCs and flora species included in the SPZ and management actions required.

Table 9.1 Management Actions for protection of values in grazed SPZ areas

Value to be protected	Grazing probability[1]	Management Action
Ecological Vegetation Class		
Clay Heathland	Low	EVC does not occur within grazed area
Riparian Forest	High	Develop grazing strategies to minimise impacts
Heathy Woodland	High	EVC does not occur within grazed area
Floodplain Riparian Woodland	Low	EVC does not occur within grazed area
Creekline Grassy Woodland	High	EVC does not occur within grazed area
Rocky Outcrop Shrubland/Herbland Mosaic	Low	Regular monitoring to assess impacts
Riverine Escarpment Scrub	Low	Regular monitoring to assess impacts
Riparian Mosaic – North East	High	Develop grazing strategies to minimise impacts. Regular monitoring.
Grassy Woodland	High	Develop grazing strategies to minimise impacts. Regular monitoring
Perched Boggy Shrubland	High	EVC does not occur within grazed area
Plains Grassy Woodland	High	Grazing to be excluded given the small area of the EVC on public land
Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic	High	Develop grazing strategies to minimise impacts. Regular monitoring
Endangered flora species		
Those species listed in Appendix K		Where grazing licences overlap with rare and endangered flora SPZs, they will be reviewed on a case by case basis to ensure adequate protection of each flora species.

Note: Grazing probability is derived from assessing species comprising the EVC and determining the palatability of the EVC. A low grazing probability indicates that the EVC is unpalatable (provides little or no sustenance) and as such, domestic stock are likely to occupy the areas for short periods only. High probability indicates that the EVC is palatable to domestic stock. Refer to Study in Old-growth forest of Victoria's North East (NRE 1998e) for further information.

Management Guideline
Grazing

Grazing will generally be permitted on State forest. Grazing activities which may impact upon Reference Areas, forest regeneration areas or SPZs which are sensitive to grazing by domestic stock, will be reviewed in consultation with licensees to develop appropriate arrangements for protection of these values.

Licensees should be consulted when any changes to the licence or the licensees' use of the licence area are under consideration.

Licence conditions should be reviewed and modified where necessary, in consultation with licensees, to achieve sound management practices.

Sites should be rehabilitated, when necessary, where grazing has been discontinued.

Grazing of areas of State forest previously not licensed may be considered following assessment of the potential impacts on environmental and natural values and evaluation of economic benefits. SPZs established to protect values sensitive to grazing and which have not been licensed previously, should continue to be protected from grazing.

ACTIONS

In consultation with licensees, review current licensed areas to assess the impact of grazing on water quality, soil stability, flora and fauna values and fire management as a basis for any necessary improvements in stock management practices.

Establish and monitor grazing management standards in conjunction with licensees.

On receipt of applications, assess proposals to graze areas of State forest not currently licensed. Consider access, natural permanent water supply, the potential impacts on water quality, soil stability, flora and fauna values and fire management, and relative economic benefits of the proposal.

Exclude grazing by domestic stock from Reference Areas (and associated buffers), areas of forest regeneration and SPZs specified in Table 9.1, where exclusion of grazing is essential for protection of natural values.

9.5 BEEKEEPING

Forests of the North East are regarded as an important resource by the bee-keeping industry. They provide a source of nectar and pollen for the production of honey, beeswax and various other by-products at varying levels depending on forest flowering patterns. Forests throughout the North East are utilised for beekeeping, however, large areas of State forest are not used primarily due to poor access, inappropriate site conditions or unsuitable flora.

Estimates indicate that the North East apiary industry produces one third of the total production of honey and other apiary products of Victoria (VicRFASC 1998a).

The strategies in this Plan have been developed in accordance with *NRE Policy No. 21.5PL Apiculture (beekeeping) on Public Land* (NPS 1995a).

Usage of the forest varies from year to year, depending on flowering patterns of eucalypts, which form the major nectar resource. Species of particular value are Red Stringybark (*Eucalyptus macrorhyncha*) and Red

Box (*E. polyanthemos*). Other forest types containing gum, peppermint and ash eucalypt species, for example Snow Gum (*E. pauciflora var. alpina*) and Alpine Ash (*E. delegatensis*) and associated understorey species provide honey flow when the drier forest types are less productive (VicRFASC 1998a). Because of sporadic flowering seasons, apiarists require access to a wide range of areas to maintain honey production. Decisions to restrict access to State forest because of other management imperatives, need to consider the value to apiarists of reliable access to nectar and pollen resources.

Access to State forests for bee-keeping is managed through the issue of annual licences and temporary permits (3 or 6 months) under the *Lands Act* 1958 or the *Forests Act* 1958. Licences allow access to a site for locating hives and, usually, exclusive access to forest nectar and pollen resources within a radius of 1.6 or 0.8 km. Annual licences for bee sites are issued for pre-determined locations and may be re-issued subject to the licensees' compliance with licence conditions. Temporary licences are issued for pre-determined sites to assist orderly and efficient utilisation of the resource, while allowing licensees to capitalise on prolific flowering seasons. Currently, there are 61 annually-licensed bee sites, and approximately 133 temporary bee sites currently licensed on State forest in the North East. A number of recognised temporary bee sites are currently not licensed.

Some studies suggest that introduced bees may adversely affect native ecosystems (Paton 1993). Although the magnitude of these effects has not been evaluated, issues of potential concern include:

- competition for nectar and pollen with native fauna;
- a long-term decline in native pollinator populations as a consequence of competition for resources;
- inefficient pollination of native plant species;
- hybridisation of native plant species; and
- occupation of tree hollows by feral bees.

Notwithstanding these potential effects, beekeeping is consistent with the broad management objectives of State forest, provided care is taken with the location and management of apiary sites. There is no general requirement to exclude beekeeping from SPZ and all existing sites will continue to be available unless specific conflicts with other values become apparent. Applications for the establishment of new sites within SPZ will be considered where the protected values will not be compromised by the presence of large numbers of bees or associated apiary management activities. It would be inappropriate, for example, to permit new apiary sites to be cleared within areas protected for old-growth forest values, or for apiaries to be located in the vicinity of the breeding sites of a threatened species.

Large bee populations may interfere with recreation activities by creating a nuisance for picnickers and campers. NRE generally avoids licensing sites in the vicinity of recreation areas, at least during periods of high visitor use.

Apiculture is excluded from areas gazetted under the *Reference Areas Act* 1978 and from wilderness areas. Further, apiaries are not permitted in State forest within 2 km of a Reference Area, and within 1.6 km (annual licences) or 0.8 km (temporary permits) of a wilderness area.

Some forest management activities may affect the conduct of bee-keeping in State forest. The removal of all or part of the tree canopy during timber harvesting reduces the short to medium term availability of nectar. However, most harvesting in the North East is in Alpine Ash stands which are not of prime concern to apiarists. Smoke and heat from fuel-reduction burning may kill foraging bees and damage buds and flowers required for nectar. NRE endeavours to coordinate fuel-reduction burning activities with use of forest areas by bee-keepers to minimise conflict. Yellow Box (*E. melliodora*) trees in State forest are protected in order to assist the apiary industry.

Aim

Provide apiarists with opportunities for beekeeping in State forest while minimising any adverse impacts on other forest values.

Management Guideline
Bee-keeping

Effective and regular liaison with bee-keeping industry organisations should be maintained.

Apiary activities by registered beekeepers will continue to be permitted except apiaries will not be permitted:

- within 2 km of Reference Areas (gazetted under the *Reference Areas Act* 1978);
- within 1.6 km (annual licences) or 0.8 km (temporary permits) of wilderness areas (wilderness parks or wilderness zones included on the schedules of the *National Parks Act* 1975)
- within 500 m of developed recreation sites;
- within specified SPZs (unless beekeeping does not conflict with management aims – see the text above); and
- within 1.6 km of an annual bee site or 0.8 km from an occupied temporary site.

Temporary apiary permits should be limited to pre-determined sites. All sites should be mapped and marked in the field as an aid to location and management.

New temporary sites may be established on demand subject to a site inspection that considers, at a minimum:

- the general suitability of the site and its proximity to other annually licensed and temporary sites;
- fire protection requirements;
- the standard of access to the site and the cost of maintaining access; and
- the need for a suitable cleared area for the location of hives.

A degree of overlap between sites may occur if there are no management impediments, and if the affected licensees consent.

Licensees should be consulted when timber harvesting, fuel-reduction burning or other forest management activities may affect their sites, or when unsuitably located sites must be moved.

9.6 DEFENCE FORCE TRAINING

State forests of the North East, along with other categories of public land, are often used by the Defence Forces for training of personnel. Defence Force training is permitted in State forest, provided:

- the types of activities, their timing and location is agreed between the Defence Forces and NRE;
- training is carried out under conditions specified by NRE to minimise any environmental impacts;
- fire prevention requirements can be met; and
- training is excluded from specified areas including Reference Areas, areas of high recreation use, and some SMZ and SPZ areas where Defence Force Training would compromise the values of the zone.

NRE policy No. 21.1PL *Defence Force training on public land* (NPS 1995b) provides detailed guidelines, procedures and legislative framework for the conduct of Defence Force training on public land.

Army units based at Bandiana and Bonegilla (near Wodonga), and to a lesser extent those from Puckapunyal, metropolitan Melbourne and, less frequently, interstate, use North East Victoria for training. A wide variety of bushcraft, survival, navigational, logistical and tactical skills training is undertaken in State forest areas. These can include combat patrols using weapons and blank ammunition, digging of trenches and pits, camping, navigation and, during low fire danger periods, use of pyrotechnics.

Certain training activities are acceptable in State forest, subject to conditions specified by NRE in approving the training exercise, but may not be permitted in parks and conservation reserves. These include the carrying and use of firearms and blank ammunition, activities involving soil disturbance (such as digging and filling of trenches), cutting of vegetation for camouflage, exercises involving large numbers of personnel and survival training involving collecting and consuming plants and animals.

The Stanley State forest, Barambogie State forest and Mount Pilot Multi Purpose Park are frequently used for Defence Force training. Other State forests are used less intensively.

Road damage is a potential consequence of Defence Force training, as large vehicles are often used in training and some exercises involve extensive use of the forest road network. Approval of each exercise requires consideration of the nature of the exercises, anticipated weather, road conditions and fire danger. Particular roads are excluded from use by heavy vehicles during winter months, as a condition of approval of exercises.

Defence Force training exercises can provide lasting benefit to forest users. At least one road and one timber bridge have been constructed in State forests in the North East by Australian Army Engineers, and road maintenance has been undertaken in the Beechworth area. Further, contributing to skill development in the Defence Forces is obviously in the national interest.

Aim

To provide for Defence Force training in State forest, while minimising any environmental effects and avoiding conflict with other forest users.

Management Guideline

Defence force training

Defence Force training should be in accordance with the guidelines and procedures detailed in NRE policy *21.1PL Defence Force training on public land* (NPS 1995b). The following guidelines complement the current policy.

Applications for Defence Force training should be assessed on an individual basis so that the particular requirements of each exercise can be considered and appropriate conditions applied.

Seasonal factors including winter road conditions and summer fire danger will be considered in the approval process.

Defence Force training should generally be scheduled to avoid periods of high visitor usage and will avoid use of popular recreation facilities such as picnic and camping areas.

Sites used for vehicle recovery training may require highly visible temporary safety fencing between training exercises, for the protection of other forest users.

Movement of vehicles off formed roads and tracks should not be permitted.

Campsites must be approved and rubbish removed upon completion of exercises.

It is expected that the Defence Forces, in using State forest, will conform to similar environmental care requirements as those imposed upon the timber industry by the *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a).

NRE will, where possible, encourage and facilitate training exercises that provide lasting benefit to forest users (e.g. bridge construction etc.).

Chapter 10
FOREST ROADS

NRE is responsible for the network of roads in State forest in North East Victoria. The origins of the network go back into the latter part of last century when miners searching for gold and graziers created tracks and bridle trails. With the development of the timber industry, the road network increased significantly. The density of forest roads has increased through the years, with the majority of logging roads and four wheel drive fire access tracks being constructed in the 1950s and 1960s.

This network is connected to those managed by Parks Victoria, Hancock Victorian Plantations Pty Ltd (on public land licences), Alpine Resorts, municipalities and VicRoads. Table 10.1 details the responsibility of various bodies for road construction and maintenance.

Table 10.1 Responsibility for road construction and maintenance in Victoria

Authority	Responsibility
Roads Corporation	Proclaimed main roads and highways
Local government	Roads and legal easements providing access to private property
NRE	Roads and tracks in State forest[1]
Parks Victoria	Roads and tracks in parks and conservation reserves
Hancock Victorian Plantations Pty Ltd	Roads and tracks in plantations on leased public plantation land
Alpine Resorts	Roads and tracks in alpine resorts
Commonwealth Government	Financial contribution to the maintenance of access to specific sites on public land occupied by Commonwealth installations

Note: 1. Temporary tracks for access to current logging areas are constructed by the timber industry.

Road standards vary across the North East. Generally, roads comprising the major access routes are relatively well maintained, whilst others may be in poorer condition. The majority of forest roads in the North East were built prior to the introduction of the *Code of Forest Practices for Timber Production* (the *Code*) (NRE 1996a). The *Code* specifies minimum standards of road design to minimise environmental impacts and ensure public safety.

This Plan reviews and rationalises the road network to reduce maintenance costs and environmental impacts, while maintaining an adequate road network for all forest users.

Aims

- ***Provide a road network suitable for forecast levels of forest utilisation, recreation and fire management.***
- ***Design, construct, upgrade and maintain forest roads to standards adequate for intended uses, safety and minimal environmental impact.***

10.1 ROAD CLASSIFICATION

The existing road network managed by NRE in State forest in the planning area totals approximately 3 000 km, almost all of which is open to the public.

NRE categorises roads by function, or primary use and standard. Roads may have more than one function. The primary purpose of NRE roads in the North East is as shown in Table 10.2.

Table 10.2 Primary purpose of the current network of North East State forest roads

Primary purpose	Proportion of total length (%)
Fire protection[1]	51
Hardwood production	23
Recreation	19
Conservation area access	4
Softwood production[2]	2
Private access[3]	1
Total	**100**

Source: (NRE 1998c)

Notes:

1. Includes tracks with a specific strategic fire protection purpose as well as other tracks that have no use other than improving the general level of access to State forest which may provide fire protection benefits.
2. Access through State forest to Hancock Victorian Plantations Pty Ltd plantations.
3. NRE has no legal obligation to provide or maintain access to private property but in a number of cases, forest roads provide practical access to private property.

Road standards are based on design parameters, such as carriageway width, grade, alignment, radius of curves and composition of the pavement. These determine vehicle speed and access during wet weather. Forest roads and tracks are divided into five classes. Table 10.3 shows the percentage of road length in each of the five classes. There are relatively few surfaced, high speed, all weather two lane roads (Class 1) and most roads are one lane roads (Class 3 or 4) or tracks (Class 5).

Table 10.3 Class of NRE roads and tracks in North East State forests

Class	Description	Proportion of total length (%)
1	Good surface, two vehicles pass without difficulty, speed not unduly affected by grades, curves or condition of surface	1
2	Good surface, two vehicles pass only with difficulty, speed reduced by grades, curves and condition of surface	1
3	Insufficient width for two vehicles to pass, speed reduced by grades, curves and condition of surface	20
4	Unformed road on which insufficient width for two vehicles to pass, speed reduced by grades, curves and condition of surface	39
5	4WD vehicular track	39
Total		**100%**

10.2 THE PERMANENT ROAD NETWORK

Forest roads were primarily established for hardwood harvesting and fire management purposes. Logging roads were constructed to a considerably higher standard than fire tracks, which were built for occasional summer use. Much of the network was built in the 1950s and 1960s, and maintenance and upgrading of roads has varied according to availability of funding and continuing usefulness of roads.

Since 1989, the *Code* and forest management prescriptions have been introduced to ensure consistent environmental protection during road construction, improvement and maintenance. While roads constructed for commercial forestry purposes are required to conform with the *Code*, the environmental standards within it have been adopted as the required standard for all new roads constructed by NRE.

Some roads built before development of the *Code* do not meet current standards, but all new road construction complies with the *Code*. Implementation of the *Code* has resulted in a progressive improvement in road construction and maintenance standards.

During the planning period, there may be some requirement for road construction to reach regrowth ash stands in the Tallangatta and Mansfield districts. However, road management emphasis will be on upgrading of existing roads to improve trafficability and reduce off-site environmental impacts.

Road maintenance requirements

Roads and tracks forming the permanent road network require regular maintenance to ensure safety of use and minimise environmental impacts, particularly on water quality. Some roads require upgrading to meet current standards and others require seasonal closure, limited use restricted to emergencies and management only, or closure and rehabilitation.

Native forest areas generally produce high quality water. However, it has been recognised that deleterious effects on water quality and aquatic environments can occur due to inadequate road construction and maintenance practices. Failure to keep up with road and track maintenance increases the risk of water quality decline resulting from sediment-bearing runoff.

NRE has conducted a survey of roads in three broadly representative catchments across north eastern forests. The survey indicated that 42% of the track network is in need of maintenance including improved drainage near stream crossings, unblocking culverts and table drains and the installation of additional drainage structures. This information will assist in developing annual road maintenance programs and timelines for remedial action.

Regular road maintenance is also necessary to keep roads safe and trafficable for all road users. High road maintenance standards provide economic benefits through reducing haulage times for timber traffic and improving access to State forest for a wider range of tourist traffic.

10.3 ROAD MANAGEMENT

The forest road network is used by a variety of users including the timber industry, 4WD tourists, motorcycle trail riders, NRE and numerous other users. Construction, maintenance and upgrading of roads used for timber extraction are funded through a roading charge paid by the timber industry.

NRE seeks to encourage the use of forest drives for pleasure driving, and to maintain four wheel driving opportunities including a network of through routes for 4WD touring where possible, while reducing potential environmental problems and maintenance costs. Details of Forest Drives and four wheel drive routes promoted by NRE and other bodies are detailed in Appendix R.

There is some potential for involving volunteers, such as members of the Victorian Association of Four Wheel Drive Clubs (VAFWDC) in an Adopt-a-Track program. Volunteers agree to clear and maintain drainage on nominated tracks. While this type of program can make a valuable contribution to road maintenance, it is limited to work that can be performed with hand tools, and is better suited to flat or gentle grades. All roads require maintenance using mechanical plant, such as graders, dozers and excavators, especially those in steep and erodible country, for the network to remain in a reasonable condition.

Road construction, improvement and maintenance works in catchments inhabited by the Spotted Tree Frog require extra care, due to the frog's probable sensitivity to increased sediment levels in streams. A number of roads and tracks constructed prior to the introduction of the *Code* will need to be upgraded according to the guidelines described in *Water quality protection measures for the conservation of Spotted Tree Frog* (O'Shaughnessy and Associates 1995), provided the remedial action does not lead to a temporary increase in sediment levels.

Management Guideline

Roads

Roads should be designed, constructed and maintained to provide a road network consistent with the above aims.

New roads and major road upgrades should be designed to:

- conform with the *Code* and FMA prescriptions; and
- minimise environmental effects, the number of major stream crossings and encroachment on the Special Protection Zone (SPZ).

Roads constructed for a once-only use (e.g. a temporary logging road or a fuel reduction burning or fire suppression track) should be permanently closed and rehabilitated as soon as practicable after use.

Roads that were not designed or intended to support traffic during winter should be subjected to seasonal closures.

The condition of roads should be periodically monitored.

Roads needed for management purposes but capable of supporting only low volume intermittent traffic should be designated 'Restricted Access Only'.

Roads should be maintained in a planned and cost-effective manner.

- The condition, inherent stability, environmental impacts, recreational uses and the community benefit of roads and tracks should be considered when deciding between road maintenance or closure and rehabilitation.
- Expenditure of roading funds for the extraction of timber should be planned in consultation with Timber Industry Roading Advisory Committees. The expenditure of NRE funds earmarked for 4WD recreation roads should be planned in consultation with the appropriate peak body of recreation users.

ACTIONS

Manage roads in accord with the guidelines above.

Close and rehabilitate roads causing an unacceptably high risk of sedimentation.

Progressively implement road drainage and stream crossing improvement works in accordance with standards detailed in the* Code, *commencing with the sites identified in the representative catchment study.

Establish and maintain a spatial database of the road network in State forest that meets public, industry and NRE needs for purposes including commercial timber harvesting, recreation and fire management.

Incorporate into the Wood Utilisation Plan (WUP), a three year road construction and major maintenance schedule.

Prepare annual construction and maintenance schedules for recreation and fire management roads.

Shared responsibilities

Some roads in State forest may be important for access to parks and conservation reserves, softwood plantations, Commonwealth Government and commercial telecommunications facilities or provide alternative

access for local residents. Conversely, some roads managed by other authorities may be important access routes to State forest for hardwood sawlog haulage, fire management or forest recreation use. Formal and informal arrangements for works to be undertaken by one agency and financial contributions to be made by another are in place. For example, Telstra contributes to the cost of maintenance of access roads to telecommunications installations, and the Roads Corporation provides tourism funds to Shires to maintain park access roads, which may include State forest roads.

ACTION

Liaise with Shires, Roads Corporation, Parks Victoria, Hancock Victorian Plantations Pty Ltd, telecommunications companies, Alpine Resort Management Boards, and other agencies to establish appropriate cost sharing arrangements for shared roads.

10.4 ROAD CLOSURES

It is sometimes necessary to close forest roads or restrict their use. Such closures may be temporary, seasonal or permanent. Reasons for closure include:

- road or track deterioration;
- protection of timber harvesting roads during winter;
- protection of water quality;
- preference being given to vehicle-free recreational use (e.g. cross country skiing during winter);
- protection of recent road construction or improvement works;
- protection of conservation areas;
- security of private property or assets;
- safety of users;
- road or track is obsolete, redundant, duplicated or unnecessary; and
- road or track is prohibitively costly to repair or maintain.

NRE is responsible for closure of roads and tracks in State forest. Representatives of the appropriate peak recreational user body, the timber industry and other interested parties will continue to be consulted regarding proposed road and track closures. Consultation with the Victorian Association of Four Wheel Drive Clubs (VAFWDC) representatives about the provision of an adequate road network formed an integral part in preparation of this Plan.

Temporary road closure

Temporary road closures under the *Forests Act* 1958 are generally implemented for short periods. Closures are primarily in the interests of public safety in emergency situations caused by hazards such as landslips, snow falls, road damage and fire suppression, or during forest management operations. The *Code* requires closure of roads when weather or road surface moisture conditions threaten water quality or the integrity and long-term serviceability of the road itself. The *Code* also requires suspension of timber transport in dry weather on roads where dry conditions may cause surface materials to break down and pose a threat to stream or wetland water quality in subsequent wet weather.

Road users should be informed of temporary closures, unless alternative routes are readily available and little inconvenience is anticipated.

Seasonal road closure

A number of roads and tracks in the planning area are currently closed during winter. Commonly this closure applies from after the Queen's Birthday long weekend to before the Melbourne Cup weekend (approximately mid-June to late-October). The seasonal closure may be extended if unsuitable weather conditions persist. Vehicles could significantly damage these tracks during wet weather, leading to erosion, consequent environmental damage and costly repairs. Roads may also be closed for the winter following road improvement works, to protect the surface from damage. Seasonal road closures, though primarily designed to protect roads, ensure the safety and convenience of the majority of drivers.

As seasonal road closures can inconvenience forest users, particularly those using vehicles for recreation, details of closures are made available from NRE and Parks Victoria offices, information centres and the Internet. The list of seasonally-closed roads (Appendix Y) will be reviewed annually in accordance with the guidelines below.

Permanent road closures

During the planning process, a number of roads were identified as being no longer required. A program of road closure and rehabilitation is required to achieve the planned permanent (major) road network, and to ensure that closed roads do not contribute to environmental degradation.

A road or track that has been closed to public vehicle access may be retained for use by management and emergency vehicles.

Appendix Y lists roads and tracks to be progressively closed and rehabilitated in the planning period.

Other roads and tracks, not currently listed, may later be identified as requiring closure and rehabilitation. Closure requires approval of the Governor-in-Council, following consultation with affected user groups.

Management Guideline
Road closure

TEMPORARY ROAD CLOSURES

Implement temporary road closures on those roads:

- considered to be unsafe for vehicular use; or
- undergoing management activities that will affect public safety; or
- where continued use could result in damage to the road surface or lead to unacceptable levels of stream sedimentation.

Inform road users of temporary road closures, using appropriate means.

SEASONAL ROAD CLOSURES

Seasonal road closures should be implemented, where required, to:

- prevent vehicle traffic on roads and tracks which are unsafe during winter;
- limit damage to the road and track network;
- prevent an increase in stream sedimentation;
- protect the road and track surfaces during the winter following road and track construction and maintenance works; or
- where non-vehicle recreation such as cross-country skiing is being given preference.

Seasonal closures will be determined annually and publicised through NRE and Parks Victoria offices, information centres, VAFWDC and the Internet.

continued next page

Management Guideline – Road closure - continued

PERMANENT ROAD CLOSURES

To be a candidate for permanent closure, a road must be one or more of the following:

- unsafe and excessively difficult or expensive to make safe;
- eroding severely in places, causing stream siltation or turbidity;
- excessively expensive to maintain e.g. road surface softened by soaks and springs;
- affected by bridge or stream crossing failure;
- able to enhance recreational opportunities by its closure (e.g. achieve vehicle-free cross country skiing, enhance remote or wilderness recreation opportunities);
- providing duplication of access; or
- no longer required for the purpose for which it was constructed.

RESTRICTED ACCESS

For a road to be classified as *restricted access only*, it must:

- be required for access for fire protection or other management purpose;
- be inappropriate for public vehicle use due to environmental sensitivity, safety concerns, location within a reference area or closed water catchment, or in order to enhance non-vehicular recreation opportunities; and
- be capable of supporting limited management vehicle use without unacceptable environmental impact.

ACTIONS

Manage roads in accordance with the above Guidelines.

Continue consultation with VAFWDC, timber industry and other appropriate road user bodies concerning seasonal and permanent road and track closures.

Close and rehabilitate roads causing high sedimentation to adjoining drainage lines.

Close roads temporarily, seasonally or permanently according to the list in Appendix Y.

Erect signs and undertake appropriate publicity to inform the public about road and track closures.

Monitor compliance of closures and undertake enforcement patrols where necessary.

Periodically monitor closed roads and nearby streams for visible indicators of sediment reduction in streams. Undertake further remedial action if necessary.

Encourage involvement of interest groups in an Adopt-a-Track program.

Chapter 11
RESEARCH AND EDUCATION

11.1 RESEARCH

An increased understanding of forest ecosystems, management activities and their interaction is achieved through forest research programs conducted by NRE and other organisations. Continued research activity is an integral part of responsible forest management. Some research involves establishment of a temporary plot for a single survey or measurement at a location (for example the flora and fauna surveys undertaken for mapping Ecological Vegetation Classes (EVC) and sawlog volume plots measured as for the Statewide Forest Resource Inventory (SFRI) program). Other research requires a series of measurements of the same site through time, to ascertain the change that has occurred. This type of research requires that an area of forest be excluded from certain management practices while still an active research site.

Aim

Improve knowledge about forest ecosystems and management activities and their interaction.

One on-going research project located in State forest of the North East is the Cropper Creek forest hydrology project. Commenced in 1975 near Lake Buffalo, this research program explores water yield and water quality aspects of radiata pine plantations in North East Victoria (O'Shaughnessy and Bren 1998). The research is undertaken by the Cooperative Research Centre for Catchment Hydrology, which involves NRE, Hancock Victorian Plantations Pty Ltd, universities, CSIRO and the Forests and Wood Products Research and Development Corporation.

Other projects include measuring forest growth in mature Alpine ash thinning plots at Mount Pinnibar and Clear Hills, tree breeding research at Toombullup and Bindaree, and on-going fauna research in the Riley Creek area for Long-footed Potoroo. There are 13 streamside sites in the North East for Spotted Tree Frog research and 9 biological control sites for pest plants being monitored by NRE's Keith Turnbull Research Institute.

State forest research is generally initiated by NRE or educational institutions, generally universities. NRE facilitates organisations or individuals to undertake research on public land and in some cases may specify conditions. Charles Sturt University and LaTrobe University students are currently undertaking research in State forest close to Albury–Wodonga, in fields including fire ecology and botany.

The long-term exclusive use of areas of State forest for research may conflict with some forest uses or activities. In some cases management activities, which are incompatible with the objectives of the research, may need to be excluded. Refer to Table 11.1 for the locations of NRE research sites and growth plots. Consultation with the relevant research project managers is required prior to any activities occurring within research areas.

Management Guideline

Assessment of research project proposals

Where required, approval for applications to undertake research should consider the duration, type and method of the study and other NRE requirements or conditions.

Use of existing research sites and reference areas or education areas in preference to State forest should be encouraged, particularly if the nature of the intended research may require suspension of normal management activities.

Exclusive use of an area of State forest may be permitted depending upon:

- the public benefit of the study;
- other uses or requirements for the proposed study area; and
- duration of the study.

Table 11.1 North East research sites

Research Project	Number of sites	Manage-ment Zone	Future Management
Cropper Creek Hydrologic Research Project (Myrtleford)	2 sub-catchments	SMZ	Permitted activities in the Ella and Betsy Creeks should be limited to those that are compatible with experiment objectives.
Mt Pinnibar 1928 Alpine ash thinning trial	8	SMZ	Permitted activities should be limited to those that are compatible with experiment objectives.
Clear Hills 1957 Alpine ash thinning trials	7	SMZ	Permitted activities should be limited to those that are compatible with the experiment objectives.
Long-footed Potoroo research trapping grid (Riley Creek)	1	SMZ	Manage in accordance with Long-footed Potoroo Action Statement and Conservation Guidelines.
Spotted Tree Frog monitoring transects (Jamieson R. Nth Branch, Howqua R., King R., Buffalo Ck., Buckland R., Wongungarra R.(2), West Kiewa R., Snowy Ck.(2), Lightning Ck., Big R.(2), Wheeler Ck	13	SPZ	Manage in accordance with Spotted Tree Frog Action Statement (in prep) and Conservation Guidelines.
CFTT Tree Breeding Research: Provenance trial, EUC411, EUC413, EUC426 Old Tolmie Road, Toombullup. *E. delegatensis, E. globulus, E. nitens* estab. 1979,'81,'90	3	SMZ	Permitted activities should be limited to those that are compatible with experiment objectives.
KTRI Research Sites Blackberry Rust Fungus (6) Lords Ck; Mt Wills Ck/Snowy Ck; Lightning Ck Tk; Bullhead; Callaghan Creek, Long Spur. St John's Wort Mite (2) Highett Ridge, Eildon; Mt Elliot. Paterson's Curse Crown Boring Weevil (1) Flagstaff.	9	SMZ	Permitted activities should be limited to those that are compatible with experiment objectives.

ACTIONS

Permit research projects in accordance with the guidelines above.

Maintain a register of research sites in State forest.

Exclude management actions that are incompatible with the objectives for approved research projects, until such time as the areas are no longer required.

Encourage research projects that may increase knowledge about forests or assist forest management.

11.2 EDUCATION AND INTERPRETATION

State forests in North East Victoria are frequently visited by students from secondary schools and tertiary institutions as part of teaching programs in earth sciences or environmental studies. NRE facilitates access to the forest for educational use, as well as providing educational information in the form of NRE guest speakers, printed resources and web site information for use by students and others.

Wodonga Institute of TAFE runs courses in timber industry accreditation for chainsaw and harvesting machine use, which undertakes harvesting of timber coupes in the Stanley State Forest in accordance with the *Code* and the timber is used by local sawmills.

The Land Conservation Council identified a number of areas of public land in the North East as Education Areas, which are designated for education purposes. Five of these, the Delatite, Mount Russell, Lima South, Mount Barambogie, and Lockhart Creek Education Areas, are within State forest. While forest management practices are not necessarily modified in education areas, they are an appropriate focus for forest use for educational purposes.

A good community understanding of the role of State forests and of forest management will aid the implementation of forest management programs. Providing access and resources for school and community groups is a useful basis for improved understanding.

Aim

Improve community understanding and awareness of the role of State forests and of forest management.

ACTIONS

Continue to make NRE staff available as guest speakers for schools and community groups, having regard to other management commitments.

Continue to develop educational resource material applicable statewide, for a variety of educational users (primary to tertiary level) to facilitate educational uses of State forest and in particular, the education areas.

Chapter 12
PLAN IMPLEMENTATION

Responsibility for implementation of this Plan rests with the Secretary of the Department of Natural Resources and Environment (NRE). Executive authority for State forest management is delegated to the Executive Director, Forests Service.

NRE is a multi-disciplinary natural resource management agency responsible for the development, conservation and protection of Victoria's natural and cultural resources. NREs responsibilities include the management of:

- State forests and the control and management of fire on public land;
- commercial forest operations within State forests;
- flora, wildlife and cultural heritage;
- soil and water values and control of pest plants and animals, in partnership with landholders;
- the administration of mining and extractive industries;
- the administration of Crown Land licences and leases, including those for State forest;
- Aboriginal cultural heritage;
- fisheries and aquatic ecosystems.

The Executive Director, Forests Service in conjunction with the Regional Services Division is responsible for plan implementation.

12.1 WOOD UTILISATION PLANNING

While the zoning scheme establishes the area of State forest available for timber harvesting, the volume of forest products to be supplied is specified in sawlog licences which are issued based on sustainable yield forecasts. Sawlog licence conditions require NRE to provide licensees with Wood Utilisation Plans (WUPs) by 31 March each year. WUPs specify the individual areas (coupes) of State forest that are approved for harvesting to meet licence commitments. They are supplied to sawlog licensees who organise the harvesting and transport of logs. Harvesting is supervised by NRE and must be conducted by licensed operators in accordance with the *Code*.

The current WUP process involves individual consideration of each proposed logging coupe to ensure compliance with policy commitments to conserve forest values (flora, fauna, landscape, cultural heritage, soil and recreation opportunities). The information used to check individual coupes has been incorporated into the management strategies and zoning scheme in this Plan. The Plan and zoning scheme will streamline preparation of WUPs. New information will be considered with a view to the possible amendment of the zoning scheme or management strategies rather than considering coupes in isolation.

ACTION

Continue to prepare the rolling three-year WUPs in accordance with NRE guidelines and consistent with the content of this Plan and licence requirements.

12.2 REVIEWING THE PLAN

The management of Victoria's State forests is based on the best available information and an innovative and progressive approach to natural resource management. This Plan provides for refinement of management guidelines, prescriptions and the zoning scheme in response to new information or changes in government policy, community expectations, technology and timber market conditions. A key feature of this Plan is the use of management guidelines for natural and cultural values, and the translation of these into the Special Protection and Special Management Zones (SMZ). Inherent in the process is the provision to improve management guidelines and the zoning scheme in response to new information. Refinements will be made in an objective, systematic manner to avoid disruption to the forward planning and conduct of timber harvesting operations. A multi-disciplinary approach is essential to this process.

Where a change to zoning is warranted, any significant proposed changes will be made available for public viewing and comment. Following consideration of comments received and relevant specialist advice, approval will be sought from the Secretary of NRE for adoption of the revised zones. Detailed procedures for amending the zoning scheme is currently in preparation and will be incorporated into the North East and Benalla–Mansfield FMAs Management Prescriptions for Harvesting and Regeneration in Native Forests.

This Plan applies for ten years or until circumstances warrant a major review.

ACTIONS

Develop Special Management Zone plans and associated prescriptions.

Consider new information and, if necessary, make recommendations on possible refinements or amendments to management strategies or the zoning scheme (Guidelines for Reviewing Management Guidelines, Management Prescriptions and the Zoning Scheme are set out below).

Develop and maintain forest management prescriptions that provide detailed information relevant to implementation of this Plan.

Management Guideline

Reviewing Management Guidelines, Management Prescriptions and the Zoning Scheme

Management guidelines and prescriptions in this Plan may be reviewed under the following circumstances:

- when new information on the impact of forest management or utilisation activities on biological or cultural values becomes available;
- if the status of a threatened species changes;
- if new species are identified that are considered to be threatened;
- when monitoring of the practical implementation of the Plan indicates that improvements can be made;
- as required by new legislation, policies or action statements.

Management zone boundaries may require review if:

- changes to management strategies for certain species or values mean that the zoning system is more or less than adequate for those values;
- field inspections or better mapping indicate that minor amendments are required to create practical management boundaries or to more accurately define the location of a particular species or value. At the scale of mapping used in this Plan, the boundaries of some values cannot be accurately defined.
- the zone does not contain the values for which it was identified - amendments may be required to ensure that conservation targets are met;
- new records are listed for species whose conservation targets have not been met;
- new records of some species warrant changes to zones to include areas of good-quality habitat in exchange for areas of poorer-quality habitat;
- existing boundaries are found to place unreasonable restrictions on the practical access to areas for timber production or for infrastructure development (easements etc).

Proposed changes to the zoning scheme will be assessed according to whether they:

- ensure the CAR Reserve System continues to comply with the JANIS Reserve Criteria;
- adequately conserve the CAR values[1] identified in the Comprehensive Regional Assessment (VicRFASC 1998b);
- ensure there is no net deterioration in the level of protection of identified CAR values in the SPZ;
- will maintain the protection of national estate values at the agreed regional scale, noting that as a result of any change to the CAR Reserve System in State forest, some minor changes to individual values may occur;
- consider the maintenance of National Estate protection;
- conserve the values highlighted in the zoning scheme register of this Plan;
- maintain a well-distributed, inter-connected network of protected areas;
- at least maintain the timber production capacity of State forest in terms of volume, species and quality;
- minimise practical problems for timber harvesting or access in the General Management Zone;
- make the best use of areas that are unavailable for timber harvesting due to other considerations such as slope, access and site quality;
- avoid conflict with strategic burning zones.

1 CAR values means the conservation values as described by the JANIS Reserve Criteria embodied in the CAR Reserve System.

ACTIONS

Maintain the currency of the State forest zoning map through continual review and amendments made in accordance with the Guidelines for Reviewing Management Guidelines, Management Prescriptions and the Zoning Scheme.

Consult with stakeholders and invite comment where significant changes are proposed to management strategies or zones.

Maintain a register of zoning scheme amendments showing the area and purpose of all changes.

12.3 MONITORING

Integral to sustainable forest management is the development of criteria and indicators against which the effects of forest management and utilisation activities can be determined. In response to this need, identified in the *National Forest Policy Statement*, a working party was established. Their task was to develop a set of national baseline standards against which the criteria for forest management and utilisation activities can be assessed. The working group found that such standards should be progressively developed and incorporated into codes of practice for forest operations (JANIS 1997).

NRE has a number of processes established to monitor forest management and utilisation activities.

- Regular audits of timber harvesting operations in State forest are undertaken to provide information on implementation of the *Code*.
- Water quality in State forest streams is regularly monitored through the Victorian Water Quality network. These data can be used to detect trends in water quality and yield in forest catchments.
- Forest areas subject to timber harvesting and other management operations are recorded each year, and timber volume and area harvested are compared to licence commitments and conditions.
- The Statewide Forest Resource Inventory (SFRI) project is establishing a consistent description for forests throughout the State and will provide a baseline for future monitoring of changes in the condition of the forests.
- Forest sawlog growth and standing sawlog and residual volume are monitored through measurement of the Permanent and Continuous Forest Inventory plots.
- The Pest Management Information System provides a means to record pest infestations and to report on the effectiveness of control programs.
- The Wildlife Atlas (NRE 1998a) and Flora Information System (ARI 1994) provides a means of collecting and reporting on flora and fauna data collected by a wide variety of sources.
- Victoria's Biodiversity Strategy (NRE 1997i) establishes a requirement to maintain ecological processes and biodiversity and undertake monitoring activities.

Australia is a signatory to the Montreal Process and has therefore agreed to develop a set of regional indicators, consistent with criteria established under the Montreal Process for assessing sustainability of forest management.

Geographic Information Systems assist in data recording and storage, and enable analysis of data sets to examine the effects of proposed forest operations on forest management zones and to determine the area subject to harvesting.

ACTIONS

Continue existing monitoring activities including, in particular, audits of the* Code*, and the collection of data on areas and volumes of timber harvested.

Develop and progressively monitor appropriate indicators for forest biodiversity, water quality and other environmental values in accordance with the Montreal Process.

12.4 REPORTING

Implementation of this Plan is a vital step in ensuring sustainable forest management in the North East. Accordingly, it is important to regularly review and report on its implementation. Reviews will provide the basis for systematically adapting the Plan to changing information and circumstances and thus, ensuring it remains relevant.

ACTION

Upon adoption of the Forest Management Plan, the Regional Forest Manager will be responsible for preparation of an annual report. This report may include:

- ***implementation of biodiversity management guidelines, new records of threatened species, and any observed responses to management initiatives;***
- ***key timber production data such as area and volume harvested by product type, areas thinned or subject to other stand improvement operations critical to the maintenance of sustainable yield, and the outcomes of regeneration and stocking surveys;***
- ***water quality and yield prescriptions, in particular, the extent of harvesting in Designated Catchments;***
- ***implementation of pest plant and animal control guidelines;***
- ***recreation and tourism initiatives;***
- ***major road maintenance or construction works;***
- ***compliance with the* Code*;***
- ***significant research outcomes;***
- ***progress on implementation of the Actions and commitments in this Plan; and***
- ***recommendations for amendments to this Plan where required.***

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GLOSSARY

The following glossary has been prepared to assist in the reading of this Plan

Basal area – the sum of the cross sectional areas measured at breast height (1.3m from the ground) of trees in a given stand. Usually expressed as m^2/ha .

Biodiversity – encompasses the diversity of indigenous species and communities occurring in a given region; includes *genetic* (genes/genotypes within each species) diversity, *species* (variety of living species) diversity and *ecosystem* (different types of communities formed by living organisms and the relations between them) diversity.

Buffer (strip) – a protective margin of vegetation abutting a stream, spring, wetland, body of standing water, swampy ground or an area of rainforest, which protects it from potentially detrimental disturbances in the surrounding forest. Buffer width is defined as the horizontal distance from which various operations are excluded.

Clear-fell – a method of harvesting a coupe whereby all merchantable trees, apart from those to be retained for wildlife habitat, are removed.

Code of Forest Practices for Timber Production – a set of principles and, in some cases, minimum standards for the conduct of timber harvesting and associated works in forests in Victoria.

Competition – (in the context of forest growth) the relative growth of trees (stem and canopy) as a consequence of limited availability of water, nutrient and light availability due to other neighbouring vegetation.

Continuous forest inventory (CFI) plots – plots established throughout the forest on which tree growth information is calculated. The plots are measured periodically (every five or ten years, for example), and growth on the plot can be determined from the difference between measurements.

Coppice stems – regrowth stems originating from dormant buds on the stump, or the base of the trunk of a damaged eucalypt.

Coupe – an area of forest of variable size, shape and orientation from which logs for sawmilling or other processing are harvested.

Developed recreation site – an area with developed recreation facilities (including toilets and tables) designed for a high level of visitor use.

Disturbance – any range of factors affecting the condition of natural areas. Disturbance may be natural or human-induced. Natural disturbance includes wildfires and rainstorms and is part of natural ecological processes. Human-induced or 'unnatural' disturbance includes timber harvesting, agricultural clearing, mining and grazing. The factors that are important when considering disturbance are the origin, duration, intensity of the disturbance and its impact on the environment.

Diversity – a measure of the physical or biological complexity of a system. It refers to a range of features from artefacts to species present.

Ecological Vegetation Classes (EVC) – the components of a vegetation classification system. They are groupings of vegetation communities based on floristic, structural and ecological features.

Ecosystem – a functional system which includes the organisms of a natural community together with their environment.

Environmental weed – a naturalised non-indigenous plant species outside the agricultural or garden context which adversely affects the survival or regeneration of indigenous species in natural or partly natural vegetation communities.

Epicormic – a shoot arising from accessory bud in bark of stem of tree.

Erosion hazard, of the soil – the likelihood of erosion occurring because of the interrelationship of soil erodibility, rainfall erosivity, slope and soil disturbance.

Even-aged stand – a forest stand where all or most of the trees are of the same age, that is, they have regenerated from the same event (e.g. Ash Wednesday fires or a clear felling harvesting operation).

Extensive management – management generally only involving the minimum silvicultural activities necessary to ensure regeneration.

Fabric – the physical material of a place. For example, the fabric of cultural places might be an artefact scatter or hut.

Fauna – a general term for animals (including birds, reptiles, marsupials and fish).

Filter strip – a narrow strip of ground retained either side of a drainage line or temporary stream. In the strip trees may be felled subject to certain conditions and machinery entry is only permitted in certain circumstances.

Fire management – all activities associated with the management of fire-prone public land values, including the use of fire, to meet land management goals and objectives.

Fire prevention – all activities concerned with minimising the incidence and severity of wildfire, particularly those of human origin.

Fire protection – all activities designed to protect an area (including human life, property, assets and values) from damage by wildfire

Fire regime – the season, intensity and frequency of fire in a given area over a period of time.

Flora – a general term for plants of a particular area or time.

Flora reserves – areas set aside because of their special floristic conservation significance.

Forest coupe plan – a plan that must be prepared for each harvesting operation in public native forest and will contain a map identifying the area and a schedule incorporating the specifications and conditions under which the operation is to be administered and controlled.

Forest Management Areas – the basic units for forest planning and management in Victoria. Currently Victoria is divided into fourteen Forest Management Areas as defined in the *Forests (Timber Harvesting) Act* 1990.

Forest Management Plan (Plan) – a plan developed to address the full range of values and uses in State forest by Forest Management Area.

Forest management zone – an area of similar physical capability or forest value to which a particular NRE strategy and specific prescriptions may apply. There are three zones: the Special Protection Zone (SPZ), Special Management Zone (SMZ) and the General Management Zone (GMZ).

Forest type – a classification of forests according to their life form, height of the tallest stratum and the projected foliage cover of the tallest stratum.

FORPLAN – a computer program that applies forest values (including financial) to forest stands. It is currently used in conjunction with GIS and models for timber, water and wildlife to estimate the response of these values over time for the whole forest for various management strategies.

Fuel reduction burning – the planned use of fire to reduce fuel levels in a specified area.

General Management Zone (GMZ) – delineates the area to be managed for the broad range of forest values available in the area. The GMZ is divided into two sub-zones: 'Timber Production' where timber harvesting under standard conditions is one of the main uses and 'Other Uses' where the forest is unsuitable for sawlog production but where other activities are permitted.

Geographic Representation Units (GRU) – subdivisions created to help analyse the distribution of the reservation system across the region and the degree to which values are represented in that reserve system.

Geographic Information System (GIS) – a system which holds spatially referenced data which can be classified, overlaid, analysed and presented in map, tabular or graphic form.

Gross area – the area of a particular forest type which is capable of producing merchantable timber.

Group selection system – harvesting of small groups of trees so that new trees can replace them in the small to medium gaps created.

Growth stages – the different forms exhibited by trees at various stages in their development e.g. regeneration, regrowth, pole, mature and senescent.

Guidelines – are the directing principles adopted to establish decisions (zoning, actions or prescriptions) for the protection and management of forest values. They are not necessarily mandatory, rather they are to be interpreted and applied based on the information available and in context of the protection and management of other values in the forest.

Habitat tree – a tree that has been identified as providing important habitat for wildlife and which is given additional protection during forest operations.

Heritage – all those things we have inherited from previous generations and which we value. It includes such things as places, things and folklore.

Integrated logging – the harvesting of both sawlogs and residual logs in a single operation.

Intensive management – silvicultural intervention beyond the minimum required to ensure restocking. It can include some or all of site preparation, planting, fertilising, weed control, spacing and thinning.

Land system – a complex mapping unit that contains a pattern of land components each of which has little variation in climate, lithology, landform, soil and indigenous vegetation. The land system is regarded as a unit of management for broad scale land use.

Land use – the primary level of public land classification in Victoria. It is determined by government through the Environment Conservation Council process establishing National parks, State forest and other categories.

Landing – a place where trees and parts of trees are snigged for sorting, processing and loaded for transport from the forest. Conversion sites at which small amounts of produce are processed and which do not involve earthworks or clearing are not regarded as landings.

Landscape management zone – a composite landscape unit based upon distinct combinations of specific scenic quality classes, public sensitivity levels and seen area disturbance zones.

Landscape sensitivity – areas identified as having a high scenic quality and visual sensitivity. They are usually areas that are readily visible from high-usage recreation facilities or routes such as look-outs, campsites, walking tracks, or tourist roads and towns.

Light demanding – (in the context of forest growth) a plant species requiring full sunlight to regenerate and/or grow vigorously—synonymous with shade intolerant.

Lignotuber – swelling at the base of the stem on some eucalypts, at or below the soil level, bearing dormant buds. An adaptive survival feature. The development of the buds to suckers is stimulated by destruction or loss of the top growth.

Mature – forest stands and/or individual trees where the tree crowns are well foliated and rounded. The height and crown development of the trees has effectively ceased (compared with regrowth) but decline of the crown (loss of limbs, development of epicormic growth) has not yet significantly begun (as in the senescent or over mature growth stage).

Merchantable – used to describe trees suitable for processing into forest produce and for which a market exists.

Multi-aged stand – a stand where the trees have originated from a limited number of discrete disturbance events.

Multiple use forests – forests managed for a combination of values and uses so that a wide range of community expectations are met (e.g. Biodiversity conservation, timber and water production and recreation).

National Estate – those places, being components of the natural or cultural environment of Australia that have aesthetic, historic, scientific or social significance or other special value for future generations as well as the present community.

National park – land described as a national park on Schedule Two of the *National Parks Act* 1975. These are generally extensive areas of land of nationwide significance because of their outstanding natural features and diverse land types.

Net available area – the area of forest both suitable and available for sawlog production, once exclusions are made for the *Code of Forest Practices for Timber Production*, SPZ, and land of low inherent productivity, is defined as the net productive area.

Old-growth forest – forest which contains significant amounts of its oldest growth stage in the upper stratum— usually senescent trees—and has been subjected to any disturbance, the effect of which is now negligible.

Overwood – trees left after harvesting that compete with regeneration for light, water and nutrient.

Overmature – a growth stage of a forest stand or individual tree that is characterised by declining crown leaf area and irregular crown shape due to the loss of branches and epicormic growth (synonymous with senescent).

Permanent road – A road permanently required for the continuing management of the forest.

Prescribed burning – the planned application of fire under selected weather and fuel conditions so that the fire is confined to the pre-determined area and burns with the intensity and rate of spread necessary to achieve the objectives of management

Prescription – the standards specified according to the principles of the *Code of Forest Practices for Timber Production* and the guidelines of the Forest Management Plan which prescribe acceptable practices.

Public land – unalienated land of the Crown managed and controlled by the Minister for Environment and Conservation, the Minister for Agriculture and theMinister for Aboriginal Affairs, or the Secretary of Natural Resources and Environment, whether or not occupied under a licence or other right (but not including land occupied under a lease, or land vested or leased by the Hancock Victorian Plantations Pty Ltd, Victorian Plantations Corporation or its successor in law).

Pulpwood – see Residual log

Recreation Opportunity Spectrum – the range of opportunities for a person to participate in specific recreational activities in specific settings in order to realise predictable recreational experiences.

Reforestation – the re-establishment of a stand of trees by planting or sowing with species native to the locality on previously cleared or poorly forested land.

Regeneration (noun) – the young regrowth of forest plants following disturbance of the forest such as timber harvesting or fire.

Regeneration (verb) – the renewal of forest by natural or artificial means.

Regrowth – (a) forest stands regenerated either naturally or by seeding following death or removal of the forest overstorey.

(b) a growth stage of a forest stand or individual tree in which the crowns have a narrow conical form and where trees are actively growing.

Rehabilitation – restoration and revegetation of a site of disturbance usually associated with fire damage, forest road-works, landings and mining.

Remote and natural area – an area described as a remote and natural area on Schedule Six of *the National Parks Act* 1975 or recommended by the L.C.C in its special Wilderness Investigation as an area with remote and natural attributes.

Reserved Forest – land proclaimed under Section 42(1) of the *Forests Act* 1958 and shown on plans deposited with the clerk of the Parliament.

Residual log (including Pulpwood) – produced as a by-product of sawlog harvesting operations, including those low-quality logs suitable for conversion into sawn products or pulpwood. Pulpwood logs (those logs which cannot be economically converted into sawn products) are supplied for conversion into hardboard or paper products.

Retained trees – trees retained on a coupe during a harvesting to serve as seed trees or wildlife habitat trees, or selected to grow on after thinning.

Richness – a measure of the abundance of individual elements within a particular place. For instance, the species richness of an ecological vegetation class (EVC) is the number of species which typically occur within that EVC.

Riparian – of, or located on, the banks of rivers.

Riparian vegetation – vegetation that requires free or unbound water, or conditions that are noticeably moist along the margins of streams, drainage lines and lakes.

Rotation – planned number of years between the regeneration of a forest stand and the final harvesting for forest produce. Actual rotations will vary to suit local conditions.

Sawlog – any length of a log of merchantable species which is at least 2.7 m in length, has a small-end diameter of 25 cm or greater, does not have a sweep or crook which exceeds 1/5 diameter from a 2.4 m straight edge and is of grade D or better.

Sclerophyll – of trees, hard-leaved (e.g. members of the genera *Eucalyptus* and *Acacia*).

Seed trees – trees retained on harvested coupes to provide seed for natural regeneration of that coupe.

Seed tree system – harvesting and regeneration system used for particular forest types. All merchantable trees are harvested apart from those specifically retained for regenerating the coupe by natural or artificial seedfall and for habitat purposes.

Selection systems – trees are harvested either singly or in groups at relatively short intervals indefinitely. Used to harvest and regenerate particular forest types. By this means regeneration is established continually and an uneven-aged stand is maintained.

Senescent – a growth stage of a forest stand or individual tree that is characterised by declining crown leaf area and irregular crown shape due to the loss of branches and epicormic growth. This term is interchangeable with ‘overmature’.

Seral stage – a plant community that occurs at a particular stage of succession, which is the gradual change in the species composition of a community until it reaches a stable state composition if left undisturbed.

Shelterwood system – used for harvesting and regenerating particular forest types that may not be suited to a clearfell regime. It consists of the removal of a proportion of mature trees to allow establishment of essentially even-aged regeneration under sheltered conditions, followed by later felling of the remainder of the mature (seed) trees.

Silviculture – the theory and practice of managing forest establishment, composition and growth, to achieve specified objectives.

Single tree selection system – used for harvesting of single trees so that new trees can replace them in the small gaps created.

Site preparation – preparation of the ground to provide conditions suitable for regeneration from seed or by planting seedlings.

Snigging – the towing or winching of a log from the stump to the landing site.

Snig-track – track along which a log is snigged.

Special Management Zone – delineates an area to be managed to maintain specified values, such as flora and fauna habitat or catchment values, while catering for timber production under certain conditions.

Special Protection Zone – delineates an area to be managed for the conservation of natural or cultural values and where timber harvesting will be excluded.

Stand – a group of trees in a forest that can be distinguished from other groups on the basis of age, species composition, condition etc.

Stand condition – the health, age and size class distribution and stocking of a forest stand.

State forest – as defined in section 3 of the *Forests Act* 1958.

State park – land described as a State park on Schedule Two B of the *National Parks Act* 1975. These are generally tracts of land containing or more land types complementing those found in national parks to provide a system representing the major land types of the State.

Stocking – density of any given forest stand, usually expressed in terms of the number of trees per hectare.

Streamside reserve – a strip of vegetation retained along a stream and extending out at least 20 m (measured horizontally) from the bank. The actual width of the streamside will be determined by the width of the saturated stream flat, the nature of the forest operation to be undertaken in the adjacent forest the ground slope.

Succession – the progressive change of species composition within a stand over time. If left undisturbed this succession will continue to a climax where the species composition will remain largely unchanged.

Sustainable Yield – rate of harvest that can be maintained for a defined period in the future (usually ten years). This figure may increase in the future if the condition of the forest is improved but should not decrease except in the case of a catastrophic event such as fire.

Long-Term Sustainable Yield – the theoretical rate of harvest that can be maintained in perpetuity, i.e. when the condition of the available forest is equal to the theoretical yield of the normal forest. It is a general goal for forest managers to work towards.

Temporary road – a road constructed specifically for use during forest operations and closed at their completion. Generally a short length of road leading from a permanent road.

Threatened (fauna) – a collective term used to denote taxa that are Extinct, Endangered, Vulnerable, Rare or Insufficiently Known, or have Restricted Colonial Breeding or Roosting Sites.

Thinning – the removal of trees in a forest stand for a given silvicultural objective.

Timber harvesting – includes tree felling, snigging, and the marking, sorting, loading and carting of forest produce within a forest.

Timber production – growing and harvesting of timber from native forests.

Understorey Island – area designated within a coupe where tree removal is permitted but machine entry is restricted to allow recovery of flora species dependent on re-sprouting following disturbance.

Uneven aged stand – forest stand which contains a continuum of age classes resulting from more or less continuous regeneration within the stand over a number of years.

Unstocked sites – sites previously well forested with timber producing eucalypt species which have been disturbed by natural or artificial agencies and, as a result, the eucalypts have been replaced with non-eucalypt tree and/or scrub species of little or no value for timber production.

Value adding – the further processing of commodities into higher quality, high value goods.

Vigour, of trees – the health and vitality of growth of trees.

Water Basin – an ecological unit, defined by the physical boundaries of the watershed, it provides a natural division for assessing the environmental impact of human activities.

Wilderness area – land described as a wilderness park on Schedule Two A of the *National Parks Act* 1975 or land within a national park described as a wilderness zone on Schedule Five of the *National Parks Act* 1975. These areas are generally tracts of land remote at their core from access and settlement, substantially unmodified by modern technological society or capable of being restored to that state and of sufficient size to make practical the long term protection of their natural systems.

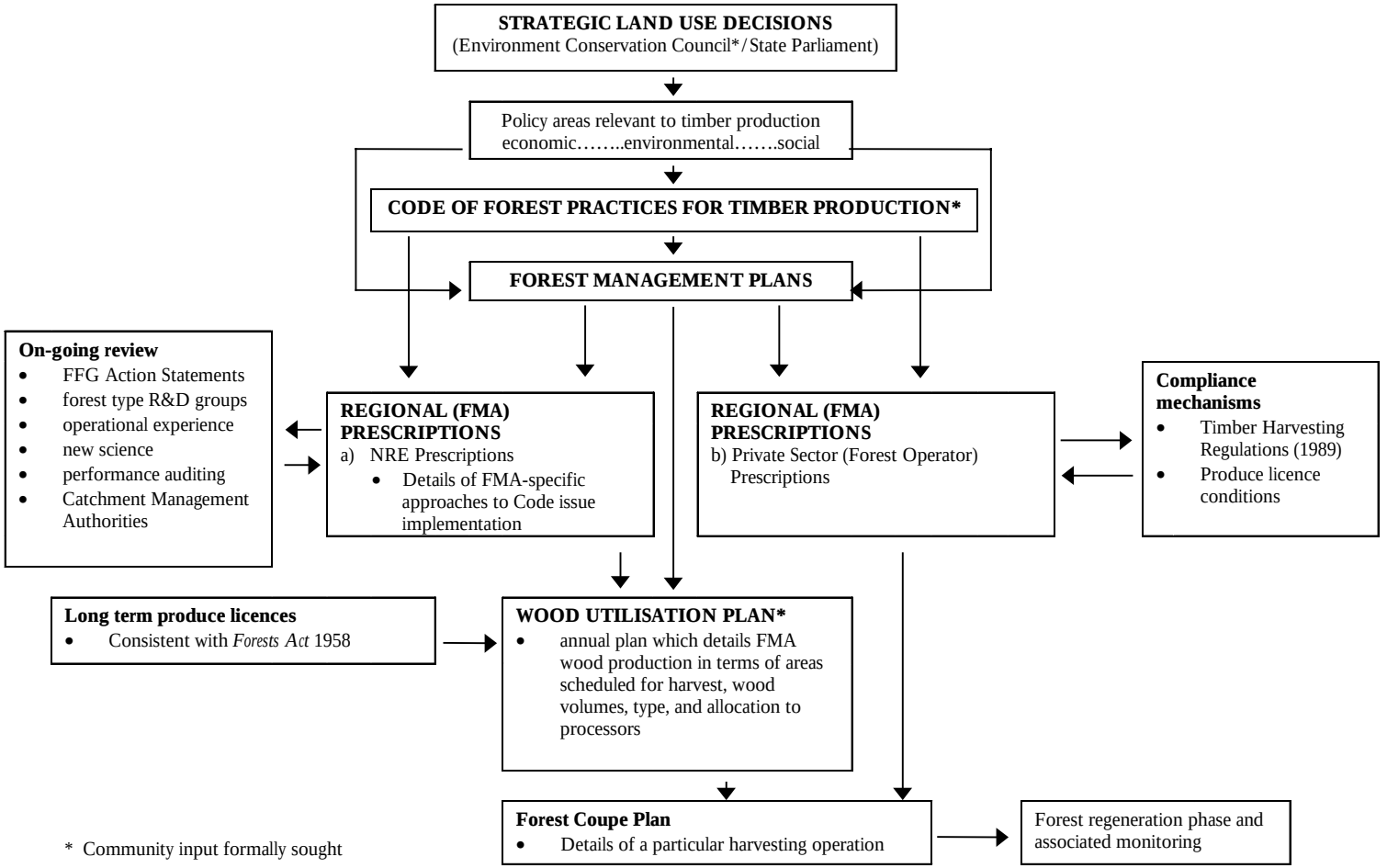
Wildfire – an unplanned fire.

Wood Utilisation Plan – details the area to be harvested and the type of wood to be produced from an FMA in any one year and provisionally for the succeeding two years; together with the allocation of timber to licensees.

APPENDICES

APPENDIX A

PLANNING AND CONTROL OF THE ENVIRONMENTAL ASPECTS OF TIMBER PRODUCTION OPERATIONS ON PUBLIC LAND IN VICTORIA



APPENDIX B

A RECORD OF MEETINGS AND WORKSHOPS HELD IN ASSOCIATION WITH THE NORTH EAST FMP AND RFA[1]

Date	Meeting type (No. of people)	Location	Group met	Purpose	Issues Discussed
29/5/97	Formal (14)	Benalla	Forest Management Advisory Committee Meeting # 1	Introduction to FMP planning process	Forest Management Plan planning process
18/6/97	Informal (2)	Nicholson St	Wilderness Society	Introduction to FMP planning process	Mt. Murray/ Wongungarra identified as main issue
1/7/97	Heritage Workshop (25)	Mt Beauty	Cross section of community	Identify areas for possible National Estate listing. Explain role of FMP in protection of heritage places in State forest	Heritage places, mailout to participants to include workshop outcomes and explanation of relationship between RFA & FMP
3/7/97	Formal (17)	Benalla	Forest Management Advisory Committee Meeting # 2	Discuss planning issues for the North East	Introduction to forest recreation issues in the North East
3/7/97	Heritage Workshop (25)	Mansfield	Cross section of community.	Identify areas for possible National Estate listing. Explain role of FMP in protection of heritage places in State forest	Heritage places, mailout to participants to include workshop outcomes and explanation of relationship between RFA & FMP
10/7/97	Heritage Workshop (30)	Wodonga	Cross section of community	Identify areas for possible National Estate listing. Explain role of FMP in protection of heritage places in State forest	Heritage places, mailout to participants to include workshop outcomes and explanation of relationship between RFA & FMP
16/7/97	Heritage Workshop (30)	Melbourne	Cross section of community (peak groups)	Identify areas for possible National Estate listing. Explain role of FMP in protection of heritage places in State forest	Heritage places, mailout to participants to include workshop outcomes and explanation of relationship between RFA & FMP
17/7/97	Public meeting (90)	Beechworth	Beechworth Environment Group and local residents	Introduction to planning process. Encourage participation & identify issues for the FMP	Logging on the Stanley Plateau
26/7/97	Public meeting (11)	Corryong	Cross section of community	Inform general community of RFA process	Forest utilisation to be balanced between resource use and conservation
11/8/97	Interest group (25)	Benalla	North East Trail Horse Riders Club	Introduce planning process and identify issues.	Continued use of State forest, group size, feed practices, cross-country riding and input to proposed track closures
27/8/97	Public meeting (App. 10)	Myrtleford	Cross section of community	Inform general community of RFA process	RFA Process. Bruce Addinsall represented the FMAAC
28/8/97	Public meeting (20)	Mansfield	Cross section of community	As above	RFA Process. Steve Junghenn represented the FMAAC. A broad range of forest interests were represented
29/8/97	Industry group (8)	Wangaratta	Executive of North East Apiarists Association	Identify any issues of concern to group	Bee site access (log landings), over-wintering in high elevation areas and a lack of uniformity of

Date	Meeting type (No. of people)	Location	Group met	Purpose	Issues Discussed
					administrative arrangements across the North East
05/08/97	Formal (16)	Benalla	Forest Management Advisory Committee Meeting # 3	Discuss planning issues for the North East	Introduction to the RFA process and biodiversity issues
08/09/97	Interest group (10)	Myrtleford	Victorian Plantations Corporation, Managers, North East	Explain planning process and identify issues of concern	Impacts on VPC managed land and roads
11/09/97	Industry group (5)	Mansfield	Licensed horse tour operators, Mansfield area	Explain planning process and identify issues of concern	Carrying capacity at Mansfield, environmental damage and possible solutions, horse feed, rider education, equity of treatment with recreational riders and one permit for all tenures
22/09/97	Professional group (16)	Myrtleford	Institute of Foresters, North East Branch	For RFA reps. to provided information about the RFA process in NE and elsewhere in Australia	Opportunities for contribution from people with forest planning expertise
23/09/97	Formal (18)	Benalla	Forest Management Advisory Committee Meeting # 4	Discuss planning issues for the NE	Timber production and socio-economic issues
07/10/97	Interest group (32)	Wodonga	Border Bushwalking Club	Explain planning process and identify issues of concern	Native forest harvesting, grazing, illness-causing microbes in NE high country water
20/10/97	Industry group (9)	Benalla	Mountain Cattlemen's Association of Victoria	Explain planning process and identify issues of concern	Long term grazing licences, licence renewability, licence conditions, consultation with licensees regarding grazing exclusions, damage to State forest by deer and concerns about deer hunters
13/11/97	Field Trip (16)	Mt Murray	Forest Management Advisory Committee & NRE staff	Discuss planning issues for the NE	Timber values, Spotted Tree Frog and Long-footed Potoroo conservation
14/11/97	Informal (3)	Wodonga	CEO of North East Catchment Management Authority	Explain planning process and identify issues of concern	Planning process and offer to brief whole board
14/11/97	Informal (3)	Shepparton	CEO of Goulburn–Broken Catchment Management Authority	Explain planning process and identify issues of concern	Roads & catchment reporting. Liaison arrangements were made
2/12/97	Formal (12)	Melbourne	Forest Management Advisory Committee Meeting #5	Discuss planning issues for the NE and review management proposals	Progress of the Plan and comments on draft sections
10/12/97	Stake holder (7)	Melbourne	Wurundjuri Tribe chairperson & member	Inform the Aboriginal community about the RFA and Forest Management Planning processes	Possible sites (currently unknown) in timber harvesting coupes. Proposal and consideration of a strategy for liaison, cultural heritage value management and assessment[2]
10/12/97	Stake holder (8)	Rubicon	Camp Jungai Cooperative Ltd camp manager /elder	As above	as above
11/12/97	Stake holder (8)	Shepparton	Shepparton Aboriginal Arts Council members	As above	as above
12/12/97	Stake	Wodonga	Mungabareena Aboriginal	As above	as above

Date	Meeting type (No. of people)	Location	Group met	Purpose	Issues Discussed
	holder (6)		Corporation. chairperson, secretary & two members		
11/02/98	Interest group (6)	Beechworth	Beechworth Environment Group	Fauna project coordinator from ARI and Manager to explain method of conducting fauna surveys following BEG concerns expressed in media	Concerns of sampling most categories of fauna over a single summer, during drought
12/02/98	Formal (16)	Mansfield	Forest Management Advisory Committee Meeting # 6	Discuss progress of Plan and review management proposals followed by a field trip to the Strathbogie Ranges	Feedback to planners, through comments on draft sections. Field visit to Strathbogie Ranges to observe selection logging of uneven aged, high elevation mixed species forest
26/03/98	Formal (20)	Wodonga	Forest Management Advisory Committee Meeting # 7	Discuss progress of Plan and draft chapters	Timber production issues. Presentations on flora survey, GIS and mapping
23/04/98	Stake holders (8)	Wangaratta	Timber Towns briefing	Briefing of municipal representatives from various NE local councils on RFA and FMP process & progress	RFA and FMP processes
30/04/98	Formal	Benalla	Forest Management Advisory Committee Meeting # 8	Discussed draft chapters and review management proposals	Timber Towns meetings, blackberries, Spotted Tree Frog and large forest owls
01/05/98	Stake holders (50)	Wangaratta	North East Apiarists' Association	Liaison at Annual Conference	RFA and FMP processes and use of log landings for bee sites
01/05/98	Stake holder (2)	Stanley State forest	Australian Army	Discuss use of State forest for military training	Requirement for forest areas close to Albury–Wodonga for military training exercises. Stanley State forest preferred location
07/05/98	Stake holder (2)	Wodonga and Shepparton	Executive Officers of North East and Goulburn Broken Catchment Management Authorities	Seeking feedback on draft Streams & Catchments chapter	Soil erosion mitigation and Proclaimed Water. Supply Catchment details
04/06/98	Formal	Melbourne	Forest Management Advisory Committee Meeting # 9	Review progress of draft chapters and consultation process	Old-growth report due for release. Presentation about Statewide Forest Resource Inventory
12/06/98	Stake Holder (4)	Melbourne	Victorian Association of Four Wheel Drive Clubs	Consult on principles for road network review, MVO, seasonal closure, permanent road closure & rehabilitation	Road network: roads to remain open and proposed seasonal and permanent track closures
17/07/98	Stake holder	Melbourne	Victorian Association of Four Wheel Drive Clubs	Further discussions on proposed future road status	As above
23/07/98	Formal (13)	Benalla	Forest Management Advisory Committee Meeting # 10	Review progress of draft chapters and management proposals	Old-growth pattern and extent
01/09/98 to 03/09/98	Formal	Corryong, Myrtleford, Mansfield	Regional Forest Agreement Directions Meeting	Promote release of CRA Reports, answer questions on Directions process	Biodiversity
15/09/98	Formal	Benalla	Forest Management Advisory	Review progress of draft chapters and zoning	Early draft of zoning scheme and biodiversity

Date	Meeting type (No. of people)	Location	Group met	Purpose	Issues Discussed
	(17)		Committee Meeting # 11	scheme	issues
13/10/98	Formal (10)	Benalla	Forest Management Advisory Committee Meeting # 12	Review progress of draft chapters and consultation	Draft chapters, draft zoning scheme and designated catchments
27/10/98 to 29/10/98	Formal	Corryong, Mansfield Myrtleford	Regional Forest Agreement Directions Meeting	Define issues for Directions Report	Various. Contrasting views expressed by the timber industry and conservation group representatives
19/11/98	Stake holder (4)	Melbourne	Victorian Association of Four Wheel Drive Clubs	Consult on principles for road network review, MVO, seasonal closure, permanent road closure & rehabilitation	Road and track network – ongoing consultation (see above)
	Stake holder	Melbourne	Friends Of The Earth		
	Stake holder	Melbourne	Wilderness Society		
26/11/98	Formal (14)	Benalla	Forest Management Advisory Committee Meeting # 13	Review progress of draft chapters and consultation	Designated catchments, Mt Murray Draft chapters, draft zoning scheme and designated catchments
17/12/98	Stake holder	Benalla	Mountain Cattlemen Association of Victoria	Consult on principles and guidelines for grazing cattle in SPZs for rare Ecological Vegetation Classes and old-growth	The impact of Special Protection Zones on grazing licenses
15/01/99	Formal (14)	Wodonga	Forest Management Advisory Committee Meeting # 14	Review progress of draft chapters and consultation	Designated Catchments and Zoning Scheme. Opportunity for input be timber industry and conservation groups
18/01/99	Stake holder	Wodonga	Victorian Farmers' Federation	Consultation of principles and guidelines for grazing cattle in SPZ for rare EVC and old-growth	Impact of SPZ on grazing licenses
16/02/99	Formal	Benalla	Forest Management Advisory Committee Meeting # 15	Review impact of Proposed Plan prior to publication	

Notes:

1. Workshops and meetings held in association with the Forest Management Plan and the Regional Forest Agreement have been recorded up to the date of preparing the Proposed Plan. Subsequent briefings were conducted after this date.
2. Five part strategy involving regular liaison meetings, management of known sites, on-going Aboriginal heritage assessment in zones likely to contain sites, state-wide management guidelines and training of staff.

APPENDIX C

ZONING SCHEME REGISTER

This lists the most significant values, which form the basis of the Special Protection Zone **(SPZ)** and Special Management Zone **(SMZ)** and should be used in conjunction with Map 2. All SPZs established in the planning process are listed in Appendix C, however some of the smaller SPZs (indicated with an * in Appendix C) are unable to be included on Map 2 due scale. Consult regional offices for more detailed maps and information.

EXPLANATORY NOTES:

Forest Management Block and Site numbers

The North East is made up of three Forest Management Areas (FMAs). These are divided into forest management blocks, ranging from 2 740 ha to 67 075 ha in size. Sites are listed and numbered according to the block in which they fall (or are mostly in). For example, Jamieson Forest Management Block (block no. 371) contains 10 sites numbered 371/01 to 371/10.

Zoning site areas

The areas shown for each zoning site are rounded to the nearest 1 ha, as the boundaries of these sites are generalised for mapping purposes. Management of these sites will be based on the boundaries shown on operational maps, as illustrated in the Inset of Map 2..

Ecological Vegetation Classes (EVCs)

These are only listed when a major reason for designation of a SPZ was to improve the conservation status of a particular EVC. A common EVC such as Shrubby Dry Forest, for example, would be listed when it was otherwise poorly represented in conservation reserves in that part of the North East. All areas of SPZ contribute to EVC conservation.

Old-growth forest

Old-growth, as defined in (Woodgate *et al.* 1994) is listed when it occurs in the SPZ.

Rare and threatened plant species

These are listed under their scientific names where known occurrences are in the SPZ or SMZ.

Fauna values

Only species or values that have management guidelines or prescriptions are listed. The requirements of the management guidelines or prescriptions are often met by a number of adjoining zones.

Linear reserves

These are generally of 200 m average width unless otherwise specified (usually 100 m buffers on both sides of a stream or as shown in Map 2). This network incorporates the Heritage Rivers Areas identified by the Land Conservation Council (LCC 1991a) and established under the *Heritage Rivers Act* 1992.

National Estate (NE)

Areas containing various National Estate values cover large parts of the North East. Conservation of these values is built into other strategies and National Estate Values are not identified in this appendix.

ZONING SCHEME REGISTER FOR THE NORTH EAST

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Jamieson	371/01	SPZ	760	EVC protection (Riparian Forest), wildlife corridor, Recreation Site (Grannys Flat, Mitchells Bridle Trail, Silver Mine)
	371/02	SPZ	80	EVC protection (Riparian Forest), wildlife corridor
	371/03	SPZ	1 288	EVC protection (Grassy Dry Forest, Herb-rich Foothill Forest)
	371/04	SPZ	24	EVC protection (Riparian Forest)
	371/05	SPZ	47	EVC protection (Riparian Forest)
	371/06	SPZ	19	EVC protection (Riparian Forest)
	371/07	SPZ	65	EVC protection (Riparian Forest)
	*371/08	SPZ	1	EVC protection (Valley Grassy Forest)
	371/09	SPZ	85	Recreation Site (Mitchells Bridle Trail)
	*371/10	SPZ	< 1	Recreation Site (Silver Mine)
Ten Mile	372/01	SPZ	75	EVC protection (Riparian Forest)
	372/02	SPZ	385	EVC protection (Riparian Forest), wildlife corridor, Recreation Site (Bains Bridge, Burns Bridge)
	372/03	SPZ	55	EVC protection (Riparian Forest)
	372/04	SPZ	46	EVC protection (Riparian Forest)
	*372/05	SPZ	1	Recreation Site (Tunnel Bend)
Terrible	373/01	SPZ	46	EVC protection (Riparian Forest)
	373/02	SPZ	490	EVC protection (Riparian Forest, Herb-rich Foothill Forest), wildlife corridor, VROT Flora (*Asplenium trichomanes, Euchiton umbricolus*), Recreation Site (12 Mile Reserve, Knockwood Reserve)
	373/03	SPZ	630	Sooty Owl, Masked Owl, Old-growth (Grassy Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland), EVC protection (Riparian Forest)
	373/04	SPZ	52	EVC protection (Riparian Forest)
	373/05	SPZ	151	EVC protection (Riparian Forest, Grassy Woodland)
	373/06	SPZ	96	EVC protection (Riparian Forest)
	373/07	SMZ	112	Smoky Mouse
	373/08	SMZ	82	Smoky Mouse
	*373/09	SPZ	1	Historic Site (United Gleeson Mine)
	*373/10	SPZ	1	Historic Site (United Gleeson Battery Site)
	*373/11	SPZ	< 1	Wildlife corridor
	*373/12	SMZ	2	VROT Flora (*Euchiton umbicolus*)
Edward	374/01	SPZ	1 827	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest, Damp Forest)
	374/02	SPZ	248	Wildlife corridor, EVC protection (Riparian Forest), Recreation Site (Snake Reserve)
	374/03	SMZ	7	VROT Flora (*Asplenium trichomanes, Eucalyptus alligatrix, Euchiton umbricolus, Ranunculus millanii, Eucalyptus alligatrix* ssp. *alligatrix*)
Snake	375/01	SPZ	1 703	Sooty Owl, Spotted Tree Frog, Recreation Site (Holylands)
	375/02	SMZ	295	Spotted Tree Frog
Slate Mine	376/01	SPZ	445	EVC protection (Riparian Forest), wildlife corridor, Spotted Tree Frog, VROT Flora (*Eucalyptus neglecta*), Recreation Site (Mitchells Bridle Trail)
	376/02	SMZ	208	Spotted Tree Frog

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Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
	376/03	SPZ	27	Recreation Site (Mitchells Bridle Trail)
Handford	377/01	SPZ	379	EVC protection (Riparian Forest), wildlife corridor, Recreation Site (Mitchells Bridle Trail)
	*377/02	SPZ	5	Spotted Tree Frog
	377/03	SMZ	12	Spotted Tree Frog
	377/04	SPZ	13	VROT Flora (*Bossiaea bracteosa, Eucalyptus kybeanensis, Eucalyptus neglecta, Glycine latrobeana, Euchiton umbricolus, Leptorhynchos elongatus, Luza alpestris, Ophioglossum petiolatum, Oxalis magellanica, Euphrasia collina* ssp. *muelleri, Lomandra oreophila*)
Sunday	378/01	SPZ	540	Spotted Tree Frog, EVC protection (Riparian Forest), VROT Flora (*Leptorhynchos elongatus, Euphrasia collina* ssp. *muelleri*), Recreation Site (Wrens Flat)
	378/02	SPZ	754	Spotted Tree Frog
	*378/03	SPZ	1	Recreation Site (The Low Saddle)
	*378/04	SPZ	21	Recreation Site (Australian Alps Walking Tk)
West Bluff	379/01	SPZ	597	EVC protection (Riparian Forest), wildlife corridor, Spotted Tree Frog, Historic Site (Upper Jamieson Hut)
	379/02	SMZ	410	Spotted Tree Frog
	*379/03	SPZ	< 1	EVC protection (Treeless Sub-alpine Mosaic)
East Bluff	380/01	SPZ	945	EVC protection (Riparian Forest), wildlife corridor, Spotted Tree Frog
	380/02	SMZ	425	Spotted Tree Frog
	380/03	SPZ	19	EVC protection (Riparian Forest)
	380/04	SPZ	43	EVC protection (Riparian Forest)
	*380/05	SPZ	< 1	VROT Flora (*Cystopteris tasmanica*)
	380/06	SMZ	13	VROT Flora (*Deyeuxia crassiuscula*)
Howes Creek	381/01	SPZ	13	EVC protection (Valley Grassy Forest)
	*381/02	SPZ	5	EVC protection (Valley Grassy Forest)
	*381/03	SPZ	2	EVC protection (Valley Grassy Forest)
	*381/04	SPZ	6	EVC protection (Valley Grassy Forest)
	*381/05	SPZ	1	EVC protection (Valley Grassy Forest)
	*381/06	SPZ	1	EVC protection (Valley Grassy Forest)
Lower Howqua North	382/01	SPZ	1 070	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest, Damp Forest, Montane Dry Woodland), Sooty Owl
	382/02	SPZ	44	EVC protection (Riparian Forest)
	382/03	SPZ	66	EVC protection (Riparian Forest)
	*382/04	SPZ	6	EVC protection (Valley Grassy Forest)
	*382/05	SPZ	4	EVC protection (Valley Grassy Forest)
	382/06	SMZ	13	VROT Flora (*Prostanthera decussata*)
Lower Howqua South	383/01	SPZ	52	EVC protection (Riparian Forest), Recreation Site (Howqual Bridle/Howqua Feeder Tk)
	383/02	SPZ	514	Sooty Owl, EVC protection (Riparian Forest)
	383/03	SPZ	76	EVC protection (Heathy Woodland)
	383/04	SPZ	151	EVC protection (Riparian Forest), wildlife corridor
	383/05	SPZ	1 523	EVC protection (Valley Grassy Forest)
	383/06	SMZ	9	VROT Flora (*Pomaderris aurea*)
	383/07	SMZ	13	VROT Flora (*Asplenium trichomanes, Eucalyptus neglecta, Euchiton umbricolus, Pomaderris aurea, Prostanthera decussata, Gynatrix macrophylla*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
	*383/08	SPZ	< 1	Recreation Site (Howqual Bridle/Howqua Feeder Tk)
Howqua North	384/01	SPZ	527	Sooty Owl, Recreation Site (Timbertop Tk)
Cornhill	386/01	SPZ	426	Old-growth values (Damp Forest, Herb-rich Foothill Forest, Montane Dry Woodland, Sub-alpine Woodland, Wet Forest, Montane Damp Forest)
	386/02	SPZ	110	Spotted Tree Frog, EVC protection (Riparian Forest)
	386/03	SMZ	387	Spotted Tree Frog
	*386/04	SPZ	9	EVC protection (Swampy Riparian Woodland)
	*386/05	SPZ	199	Barred Galaxias, Stirling Stone Fly, Recreation Site (Bindaree Falls Tk)
	*386/06	SPZ	69	Stirling Stone Fly
	386/07	SPZ	13	VROT Flora (*Oschatzia cuneifolia*)
	386/08	SMZ	7	VROT Flora (*Eucalyptus perriniana*)
Upper Howqua	387/01	SPZ	268	Old-growth values (Herb-rich Foothill Forest, Montane Dry Woodland, Montane Damp Forest)
Timber Top	388/01	SPZ	53	EVC protection (Riparian Forest)
	388/02	SPZ	20	EVC protection (Montane Riparian Thicket)
	388/03	SPZ	13	VROT Flora (*Pterostylis cucullata, Thesium australe*)
Buttercup	389/01	SPZ	86	EVC protection (Herb-rich Foothill Forest), wildlife corridor, Recreation Site (Carters Road)
	389/02	SPZ	172	Sooty Owl, EVC protection (Herb-rich Foothill Forest, Damp Forest, Montane Dry Woodland)
	389/03	SPZ	17	Old-growth values (Grassy Dry Forest)
	389/04	SPZ	12	Recreation Site (Plain Creek Loop Tk)
	*389/05	SPZ	< 1	Historic Site (Plain Creek Trestle Bridge)
	*389/06	SPZ	23	Mountain Galaxias, Historic Site (McCashney & Harper Sawmill & Baker Ck log tramway)
	*389/07	SPZ	1	Recreation Site (Buttercup Ck)
	*389/08	SPZ	1	Recreation Site (Buttercup Ck)
	*389/09	SPZ	1	Recreation Site (Buttercup Ck)
	*389/10	SPZ	1	Recreation Site (Buttercup Ck)
	*389/11	SPZ	1	Recreation Site (Buttercup Ck)
Delatite	390/01	SPZ	656	Old-growth values (Herb-rich Foothill Forest, Montane Dry Woodland, Sub-alpine Woodland)
	390/02	SPZ	135	Sooty Owl
	*390/03	SPZ	6	Recreational Site (Plain Creek Loop Tk)
	*390/04	SPZ	46	Stirling Stone Fly
	390/05	SPZ	13	VROT Flora (*Aciphylla glacialis, Agrostis muelleriana, Barbarea grayi, Cystopteris tasmanica, Deyeuxia crassiuscula, Diplaspis nivis, Eucalyptus perriniana, Euphrasia lasianthera, Euphrasia scabra, Geranium sessiliflorum* ssp. *brevicaule, Euchiton umbricolus, Goodenia macbarronii, Grammitis poeppigiana, Huperzia australiana, Isolepis montivaga, Lycopodium scariosum, Ranunculus eichlerianus, Ranunculus gunnianus, Schizeilema fragoseum, Scleranthus singuliflorus, Senecio pectinatus* var. *major, Thesium australe, Trochocarpa clarkei, Grevillea victoriae, Phebalium squamulosum* ssp. *alpinum, Pimelea ligustrina* ssp. *ciliata, Pultenaea williamsonii, Cardamine lilacina, Eragrostis exigua*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Blue Range	392/01	SPZ	20	EVC protection (Valley Grassy Forest)
	392/02	SPZ	10	EVC protection (Riparian Mosaic – North East)
	392/03	SMZ	13	VROT Flora (*Wurmbea biglandulosa* ssp. *biglandulosa*, *Poa sieberiana* var. *cyanophylla*)
Broken	393/01	SPZ	1 953	Powerful Owl, Old-growth values (Heathy Dry Forest, Shrubby Dry Forest)
	393/02	SPZ	32	Wildlife corridor
	393/03	SPZ	53	Wildlife corridor
	393/04	SMZ	38	Smoky Mouse
	393/05	SPZ	11	EVC protection (Valley Grassy Forest)
	*393/06	SPZ	< 1	Recreation Site (Evans Creek Hut)
Holland	394/01	SPZ	711	Powerful Owl
	394/02	SPZ	147	EVC protection (Montane Riparian Thicket)
	*394/03	SPZ	3	EVC protection (Swampy Riparian Woodland)
	*394/04	SPZ	1	Recreation Site (Jones Picnic Area)
	*394/05	SPZ	3	Horseshoe Bat
	394/06	SMZ	13	VROT Flora (*Billardiera scandens* var. *brachyantha*)
	*394/07	SPZ	1	Recreation Site (Jones Rd)
Upper Ryan	395/01	SPZ	178	EVC protection (Montane Riparian Thicket), Recreation Site (Toombullup North)
	395/02	SPZ	379	Sooty Owl
	395/03	SPZ	12	EVC protection (Swampy Riparian Woodland)
	395/04	SMZ	2 443	Designated Catchment (Ryans Creek), Historic Site (grave)
	*395/05	SPZ	1	Recreation Site (Kelly Tree)
	395/06	SPZ	1	Recreation Site (Stringybark Ck)
Lower Ryan	396/01	SPZ	60	EVC protection (Riparian Forest)
	396/02	SPZ	139	Sooty Owl
	396/03	SPZ	189	Powerful Owl, Old-growth values (Heathy Dry Forest, Herb-rich Foothill Forest)
	396/04	SPZ	15	EVC protection (Riparian Forest), VROT Flora (*Pultenaea williamsonii*)
	396/05	SMZ	1 994	Designated Catchment
	*396/06	SPZ	6	Powerful Owl
Upper Middle	397/01	SPZ	65	EVC protection (Riparian Forest)
	397/02	SPZ	384	Powerful Owl, EVC protection (Riparian Forest)
	*397/03	SPZ	9	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	397/04	SMZ	179	Designated Catchment (Ryans Creek)
	*397/05	SPZ	1	EVC protection (Riparian Forest)
	397/06	SMZ	10	VROT Flora (*Pultenaea williamsonii*)
Lower Middle	398/01	SPZ	1 070	Old-growth values (Heathy Dry Forest, Grassy Dry Forest, Herb-rich Foothill Forest)
	398/02	SPZ	25	Bandy Bandy
	398/03	SPZ	330	Powerful Owl
	*398/04	SPZ	3	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic & Riparian Forest)
	398/05	SPZ	450	Powerful Owl, EVC protection (Riparian Forest)
	*398/06	SPZ	4	EVC protection (Valley Grassy Forest)
	*398/07	SPZ	3	EVC protection (Creekline Grassy Woodland)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
	*398/08	SPZ	6	EVC protection (Riparian Forest)
	398/09	SMZ	6	VROT Flora (*Brachyscome gracilis, Brachyscome ptychocarpa, Juncus psammophilus, Billardiera scandens var. brachyantha, Pultenaea williamsonii, Poe sieberiana* var. *cyanophylla, Brachyscome gracilis* ssp. *gracilis)*
Evans	399/01	SPZ	558	Powerful Owl, Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest)
	399/02	SPZ	200	EVC protection (Riparian Forest, Swampy Riparian Woodland), wildlife corridor
	399/03	SMZ	103	Smoky Mouse
	399/04	SPZ	109	Historic Site (Logging Hut)
	*399/05	SPZ	1	Historic Site, Recreation Site (Tomahawk Hut)
King	400/01	SPZ	74	EVC protection (Riparian Forest)
	*400/02	SPZ	9	Recreation Site (Plain Creek Loop Tk)
	*400/03	SPZ	91	Stirling Stone Fly
King Basin	401/01	SPZ	70	EVC protection (Riparian Forest)
	401/02	SPZ	18	EVC protection (Riparian Forest)
	401/03	SPZ	23	EVC protection, Recreation Site (Craig Hut)
	401/04	SPZ	13	VROT Flora (*Goodenia macbarronii*)
	*401/05	SPZ	38	Stirling Stone Fly
	*401/06	SPZ	49	Stirling Stone Fly
	401/07	SPZ	9	Recreation Site (Craig Hut)
Upper King	402/01	SPZ	50	EVC protection (Riparian Forest)
	*402/02	SPZ	6	EVC protection (Montane Riparian Thicket)
	402/03	SPZ	11	EVC protection (Riparian Forest)
	402/04	SPZ	16	VROT Flora (*Euphrasia scabra*)
Piper	406/01	SPZ	513	Powerful Owl, EVC protection (Swampy Riparian Woodland, Rocky Outcrop Shrubland/Herbland Mosaic)
	406/02	SPZ	34	EVC protection (Herb-rich Foothill Forest, Perched Boggy Shrubland)
	*406/03	SPZ	4	EVC protection (Perched Boggy Shrubland)
	*406/04	SPZ	2	EVC protection (Riparian Forest)
Warrenbayne	407/01	SPZ	588	Powerful Owl, EVC protection (Valley Grassy Forest, Grassy Woodland), VROT Flora (*Pimelea treyvaudii*)
	407/02	SPZ	51	EVC protection (Valley Grassy Forest), VROT Flora (*Pimelea treyvaudii*)
	407/03	SPZ	80	EVC protection (Valley Grassy Forest)
	407/04	SPZ	505	Powerful Owl, EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	407/05	SPZ	12	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	407/06	SPZ	37	Recreation Sites (Lima Ck Tk, Lima Ck Falls Tk, Leerson Hill Tk)
	*407/07	SMZ	8	VROT flora (*Pimelea treyvaudii*)
	*407/08	SPZ	< 1	Mountain Galaxias
	*407/09	SPZ	2	EVC protection (Valley Grassy Forest)
	407/10	SPZ	12	VROT Flora (*Botrychium australe, Pimelea treyvaudii, Swainsona recta*)
	407/11	SMZ	5	VROT Flora (*Acacia dawsonii*)
	407/12	SMZ	11	VROT Flora (*Pimelea treyvaudii*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Dry Ck	411/01	SPZ	964	Powerful Owl, Sooty Owl, EVC protection (Damp Forest, Herb-rich Foothill Forest)
	411/02	SPZ	60	EVC protection (Riparian Forest)
	411/03	SPZ	68	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	411/04	SPZ	17	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	411/05	SPZ	94	EVC protection (Swampy Riparian Woodland)
	411/06	SPZ	182	EVC protection (Valley Grassy Forest), Historic Site (Howes Sawmill)
	411/07	SMZ	12	VROT Flora (*Dodonaea boroniifolia, Pimelea treyvaudii, Pultenaea vrolandii, Pultenaea williamsonii*)
	*411/08	SPZ	3	Horseshoe Bat
	*411/09	SPZ	3	EVC protection (Riparian Mosaic – North East)
	*411/10	SPZ	9	Horseshoe Bat, Historic Site (Crystal Mine)
	*411/11	SPZ	9	Mountain Galaxias
	*411/12	SPZ	9	EVC protection (Valley Grassy Forest), Historic Site (Crystal Mine)
Too-Rour	412/01	SPZ	1 554	Powerful Owl, EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic, Heathy Dry Forest)
	412/02	SPZ	473	EVC protection (Herb-rich Foothill Forest, Grassy Dry Forest, Rocky Outcrop Shrubland/Herbland Mosaic)
	412/03	SPZ	12	EVC protection (Riparian Forest), Recreation Site (James Reserve)
	412/04	SPZ	18	EVC protection (Valley Grassy Forest)
	412/05	SPZ	235	EVC protection (Riparian Forest, Grassy Dry Forest, Valley Grassy Forest)
	*412/06	SPZ	3	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*412/07	SPZ	2	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*412/08	SPZ	4	Horseshoe Bat, Historic Site (Howes Mill site)
	*412/09	SPZ	22	Mountain Galaxias
	*412/10	SPZ	< 1	Recreation Site (James Reserve)
Wrightley	*413/01	SPZ	6	Historic Site (McCashney & Harpers Toombullup Sawmills)
	413/02	SPZ	21	Powerful Owl
	413/03	SMZ	59	VROT Flora (*Astrotrichea linearis, Billardiera scandens* var. *brachyantha*)
	413/04	SMZ	11	VROT Flora (*Brachyscome ptychocarpa, Brachyscome gracilis*)
	413/05	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	413/06	SMZ	13	VROT Flora (*Brachyscome gracilis*)
Watchbox	414/01	SPZ	1 349	Powerful Owl, Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest), EVC protection (Riparian Forest, Riparian Mosaic – North East)
	*414/02	SMZ	9	Designated Catchment
	414/03	SMZ	9	VROT Flora (*Austrodanthonia pilosa* var. *paleacea*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Rutherglen	584/01	SPZ	87	EVC protection (Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic)
	584/02	SPZ	190	EVC protection (Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic)
Barambogie	586/01	SPZ	1 795	EVC protection (Valley Grassy Forest, Swampy Riparian Woodland, Grassy Woodland), VROT Flora (*Goodenia macbarronii, Pultenaea foliolosa, Pultenaea platyphylla, Austrodanthonia pilosa* var. *paleacea*)
	586/02	SPZ	96	EVC protection (Heathy Dry Forest, Grassy Dry Forest)
	586/03	SPZ	16	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*586/04	SPZ	1	EVC protection (Valley Grassy Forest)
	586/05	SPZ	13	VROT Flora (*Acacia deanei, Acacia doratoxylon, Brachyscome gracilis, Callitriche umbonata, Digitaria divaricatissima, Dipodium hamiltonianum, Diuris punctata* var. *punctata, Goodenia macbarronii, Lipocarpha microcephala, Pterostylis hamata, Pultenaea foliolosa, Pultenaea platyphylla, Pultenaea vrolandii, Eucalyptus cadens, Indigofera adesmiifolia, Acacia deanei* ssp. *deanei, Billardiera scandens* var. *brachyantha, Austrodanthonia pilosa* var. *paleacea, Eucalyptus sideroxylon* s.s., *Geranium sp. 6, Brachyscome gracilis* ssp. *gracilis*)
Eldorado	588/01	SPZ	22	EVC protection (Grassy Dry Forest)
Magpie	591/01	SPZ	466	Powerful Owl, Old-growth values (Shrubby Dry Forest), Recreation Site (Yackandandah Ck)
	591/02	SPZ	38	Landscape values
	*591/03	SMZ	9	VROT Flora (*Eucalyptus cinerea spp cinerea*)
	*591/04	SPZ	< 1	Recreation Site (Yackandandah Ck)
Dingle	592/01	SPZ	2 829	EVC protection (Grassy Dry Forest), Old-growth values (Grassy Dry Forest), VROT Flora (*Pultenaea foliosa, Austrodanthonia pilosa* var. *paleacea*), Historic Site (Orton Tk & Wells Murmumgee batterys), Recreation Sites (Clarkes Corner, Murmungee Lookout), landscape values
Bruarong	*593/01	SPZ	1	Historic Site (Markham Reef Gold Workings)
Stanley	594/01	SPZ	521	Powerful Owl, Historic Sites (Hydraulic Elevator & Sluicing Tray, Yackandandah Ck), Recreation Site (Yackandandah Ck)
	*594/02	SMZ	8	VROT Fauna (*Pomaderris aurea*)
Murramurrang-bong	596/01	SPZ	1 567	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest)
Big Ben	597/01	SPZ	2 717	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest, Shrubby Dry Forest), VROT Flora (*Corybas hispidus, Pimelea treyvaudii*)
	597/02	SPZ	915	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest, Shrubby Dry Forest)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
	597/03	SPZ	413	EVC protection (Grassy Dry Forest)
	597/04	SPZ	10	VROT Flora (*Corybas hispidus, Pimelea treyvaudii, Poa sieberiana* var. *cyanophylla*)
	597/05	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
Whitlands	598/01	SPZ	2 483	Powerful Owl, EVC protection (Riparian Forest, Rocky Outcrop Shrubland/Herbland Mosaic, Swampy Riparian Woodland), Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Recreation Site (15 Mile Ck Camp)
	598/02	SPZ	67	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	598/03	SPZ	27	EVC protection (Riparian Forest, Swampy Riparian Woodland)
	*598/04	SPZ	2	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*598/05	SPZ	3	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	598/06	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	*598/07	SPZ	1	Recreation Site (Boggy Ck)
Moyhu	599/01	SPZ	1 642	EVC protection (Valley Grassy Forest)
	599/02	SPZ	34	EVC protection (Valley Grassy Forest)
	599/03	SPZ	146	EVC protection (Valley Grassy Forest)
	599/04	SPZ	425	EVC protection (Grassy Dry Forest)
	599/05	SPZ	90	EVC protection (Grassy Dry Forest)
	599/06	SPZ	191	EVC protection (Grassy Dry Forest, Herb-rich Foothill Forest)
	*599/07	SPZ	4	EVC protection (Valley Grassy Forest)
Carboor	600/01	SPZ	506	Old-growth values (Heathy Dry Forest, Grassy Dry Forest)
	600/02	SPZ	30	Barking Owl, EVC protection (Valley Grassy Forest)
	600/03	SPZ	522	EVC protection (Valley Grassy Forest)
	600/04	SPZ	1 143	EVC protection (Valley Grassy Forest), VROT Flora (*Austrodanthonia pilosa* var. *paleacea*)
	600/05	SPZ	956	EVC protection (Valley Grassy Forest)
	600/06	SPZ	261	EVC protection (Valley Grassy Forest)
	*600/07	SPZ	2	EVC protection (Riparian Mosaic – North East)
	*600/08	SPZ	1	EVC protection (Valley Grassy Forest)
	*600/09	SPZ	1	Recreation Site (Meadow Ck Camp)
	600/10	SMZ	11	VROT Flora (*Austrodanthonia pilosa* var. *paleacea*)
West King	601/01	SPZ	11	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*601/02	SPZ	6	Mountain Galaxias
	601/03	SMZ	688	Designated Catchment (Musk Gully Creek)
	601/04	SMZ	64	Smoky Mouse
	*601/05	SPZ	58	EVC protection (Swampy Riparian Woodland)
	*601/06	SPZ	1	Recreation Site (Chestnut Camp Area)
	*601/07	SPZ	1	EVC protection (Plains Grassy Woodland)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Cheshunt	602/01	SPZ	1 064	EVC protection (Montane Dry Woodland), VROT Flora (*Pimelea treyvaudii*)
	602/02	SPZ	12	EVC protection (Montane Dry Woodland)
	602/03	SPZ	39	EVC protection (Riparian Forest)
	*602/04	SPZ	< 1	EVC protection (Valley Grassy Forest)
	602/05	SMZ	13	VROT Flora (*Acacia boormanii*)
Wabonga	603/01	SPZ	250	Powerful Owl, EVC protection, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	603/02	SPZ	35	EVC protection (Riparian Forest)
Rose	604/01	SPZ	10	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*604/02	SPZ	4	EVC protection (Riparian Forest)
Dandongadale	605/01	SPZ	420	EVC protection (Riparian Forest, Riverine Escarpment Scrub, Riparian Mosaic – North East)
	605/02	SPZ	779	Powerful Owl, Old-growth values (Shrubby Dry Forest)
	605/03	SMZ	13	VROT Flora (*Acacia boormanii, Pomoderris subcapitata, Billardiera scandens* var. *brachyantha, Poa sieberiana* var. *paleacea*)
Gapsted	607/01	SPZ	2 046	EVC protection (Grassy Dry Forest), VROT Flora (*Pultenaea williamsonii*)
	*607/02	SPZ	6	EVC protection (Valley Grassy Forest)
	607/03	SMZ	3	VROT Flora (*Pultenaea williamsonii*)
Ovens	608/01	SPZ	834	EVC protection (Valley Grassy Forest)
	608/02	SPZ	53	VROT Flora (*Pultenaea lapidosa*), Recreation Site (Reform Hill Tracks)
	*608/03	SPZ	1	EVC protection (Plains Grassy Woodland), Recreation Site (Reform Hill Tracks)
	*608/04	SPZ	1	EVC protection (Valley Grassy Forest)
Rosewhite	609/01	SPZ	3 926	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest), EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	609/02	SPZ	1 049	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	609/03	SPZ	1 152	EVC protection (Valley Grassy Forest)
	*609/04	SPZ	5	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*609/05	SPZ	< 1	EVC protection (Plains Grassy Woodland)
Merriang	610/01	SPZ	446	Powerful Owl
Nug Nug	611/01	SPZ	24	Old-growth values (Heathy Dry Forest,)
	611/02	SMZ	6	VROT Flora (*Eucalyptus neglecta*)
	*611/03	SPZ	16	EVC protection (Riparian Forest), Landscape values
	*611/04	SPZ	7	EVC protection (Riparian Mosaic – North East), Landscape values
	*611/05	SPZ	3	Landscape values

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Emu	612/01	SPZ	1 315	EVC protection (Valley Grassy Forest), VROT Flora (*Acacia boormanii, Agrostis australiensis, Astrotricha linearis, Pimelea treyvaudii, Pultenaea foliolosa, Pultenaea polifolia, Pultenaea tenella, Rulingia dasyphylla, Pomaderris subplicata, Acacia lanigera* var. *lanigera*)
	*612/02	SMZ	5	VROT Flora (*Astrotricha linearis*)
	612/03	SPZ	80	EVC protection (Riparian Forest)
	*612/04	SPZ	2	EVC protection (Riparian Mosaic – North East)
Abbeyard	613/01	SPZ	585	Powerful Owl, VROT Flora (*Billardiera scandens* var. *brachyantha*), Recreation Site (Buffalo River), Landscape values
	613/02	SPZ	211	EVC protection (Riparian Mosaic – North East), VROT Flora (*Lespedeza juncea* ssp. *sericea, Pomaderris helianthemifolia*), Recreation Site (Buffalo River)
	613/03	SPZ	1 213	Powerful Owl, Sooty Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Recreation Site (Buffalo River)
	613/04	SPZ	428	EVC protection (Grassy Dry Forest, Herb-rich Foothill Forest), Powerful Owl
	*613/05	SPZ	10	Mountain Galaxias, Landscape values
	*613/06	SPZ	5	EVC protection (Riparian Forest)
	*613/07	SPZ	4	Mountain Galaxias, Landscape values
	613/08	SPZ	6	VROT Flora (*Pomaderris helianthemifolia*)
	*613/09	SPZ	11	VROT Flora (*Pomaderris helianthemifolia*)
	613/10	SPZ	9	Landscape values
Yarrabulla	614/01	SPZ	90	Wildlife corridor
	614/02	SPZ	1 526	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest) and EVC protection (Heathy Dry Forest, Herb-rich Foothill Forest)
	614/03	SPZ	535	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Powerful Owl, Recreation Site (Buffalo River)
	614/04	SPZ	13	EVC protection (Riparian Forest), Recreation Site (Buffalo River)
	*614/05	SPZ	20	EVC protection (Riparian Mosaic – North East), Recreation Site (Buffalo River)
West Buffalo	615/01	SPZ	1 403	Old-growth values (Shrubby Dry Forest)
	615/02	SPZ	113	Sooty Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	615/03	SPZ	9	Powerful Owl
	*615/04	SMZ	5	VROT Flora (*Glycine latrobeana*)
	615/05	SPZ	11	EVC protection (Riparian Mosaic – North East), Recreation Site (Buffalo River)
East Buffalo	616/01	SPZ	288	Wildlife corridor, EVC protection (Swampy Riparian Woodland)
	616/02	SMZ	443	Long Footed Potoroo
	616/03	SPZ	12	EVC protection (Riparian Mosaic – North East), Recreation Site (Buffalo River)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Riley	617/01	SPZ	150	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest)
	617/02	SPZ	540	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest)
	617/03	SPZ	1 185	Old-growth values (Shrubby Dry Forest), Long Footed Potoroo, EVC protection (Riparian Forest)
	617/04	SMZ	1 704	Long Footed Potoroo
	617/05	SPZ	33	EVC protection (Riparian Forest)
	617/06	SPZ	19	EVC protection (Riparian Forest)
	617/07	SMZ	705	Long Footed Potoroo
	617/08	SMZ	244	Long Footed Potoroo
House Creek	618/01	SPZ	2 170	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Damp Forest, Montane Dry Woodland), EVC protection (Montane Dry Woodland)
Gundowring South	619/01	SPZ	537	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland, Damp Forest)
	619/02	SPZ	233	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland, Damp Forest)
Havilah	620/01	SPZ	817	EVC protection (Valley Grassy Forest)
	620/02	SPZ	912	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
Running Ck	*621/01	SPZ	2	EVC protection (Riparian Forest/Swampy Riparian Woodland Mosaic)
	*621/02	SPZ	1	Historic Site (Leviathan Battery Site)
Coral Bank	622/01	SPZ	528	Sooty Owl, VROT Flora (*Eucalyptus rubida* ssp *septemflora*)
	*622/02	SPZ	< 1	EVC protection (Valley Grassy Forest)
Porepunkah	*624/01	SPZ	2	Mountain Galaxias
	624/02	SPZ	4	Recreation Site (Buffalo River)
	*624/03	SPZ	2	Landscape values
German Ck	625/01	SPZ	518	Sooty Owl, Old-growth values (Shrubby Dry Forest)
	*625/02	SPZ	18	Sooty Owl
	625/03	SPZ	22	Recreation Site (Apex Lookout Tk)
	*625/04	SPZ	2	EVC protection (Swampy Riparian Woodland)
Mountain Ck	626/01	SPZ	33	EVC protection (Riparian Forest)
	*626/02	SPZ	5	Recreation Site (Mt Emu)
Buckland North	627/01	SPZ	142	Recreation & Historic Sites (Buckland River hydraulic sluicing & alluvial workings)
Devils Ck	628/01	SPZ	693	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Historic Sites (Buckland River alluvial workings, Growlers Ck dredge, Gunislake mining settlement, Junction mining villiage), Recreation Site (Buckland River)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Bright	629/01	SPZ	686	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland)
	*629/02	SPZ	11	Recreation Sites (Valley View Tk & Huggins Lookout Tk)
	*629/03	SPZ	18	Mountain Galaxias
	*629/04	SPZ	5	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	629/05	SMZ	382	Bakers Gully Designated Catchment
Freeburgh	630/01	SPZ	8 073	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest, Montane Dry Woodland), Historic Sites (Liffey battery, Oriental Reef workings, Phoenix battery, Williams Mine)
	630/02	SPZ	420	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest, Montane Dry Woodland)
	*630/03	SPZ	6	Recreation Site (Bright Memorial Arboretum)
	*630/04	SPZ	< 1	Historic Site (Buckeye Mine & Battery)
Snowy Ck	631/01	SPZ	1 248	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), EVC protection (Swampy Riparian Woodland), Historic Site (Sloans Sawmill), Recreation Site (Snowy Ck/Dungey Tk)
	*631/02	SPZ	7	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	631/03	SMZ	61	Designated Catchment (South Kiewa River)
	631/04	SPZ	9	Sooty Owl
	631/05	SMZ	35	Spotted Tree Frog
	631/06	SMZ	12	VROT Flora (*Pomaderris aurea, Pomaderris subcapitata*)
	631/07	SMZ	13	VROT Flora (*Almaleea capitata*)
	*631/08	SPZ	1	EVC protection (Swampy Riparian Woodland)
	*631/09	SPZ	1	EVC protection (Swampy Riparian Woodland)
	*631/10	SPZ	1	Historic Site (Blair's Top Hut)
	*631/11	SPZ	< 1	Historic Site (Dungey Tk)
	631/12	SPZ	13	VROT Flora (*Almaleea capitata, Discaria pubescens, Euphrasia scabra, Pomaderris aurea, Pomaderris subcapitata, Pterostylis fischii, Rhynchospora brownii, Thelypteris confluens*)
	631/13	SMZ	13	VROT Flora (*Discaria pubescens*)
West Kiewa North	632/01	SPZ	5	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	632/02	SPZ	945	EVC protection (Swampy Riparian Woodland), Owl Site
	632/03	SPZ	545	Spotted Tree Frog, Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest), EVC protection (Riparian Forest, Swampy Riparian Woodland)
	632/04	SMZ	4 390	Spotted Tree Frog, EVC protection (Riparian Forest, Wet Forest), VROT Flora (*Acacia dallachiana, Rytidosperma nivicolum*), Landscape values, Designated Catchment
	*632/05	SPZ	16	Sooty Owl
	632/06	SPZ	16	EVC protection (Swampy Riparian Woodland)
	*632/08	SPZ	1	Recreation Site (The Hollow)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Clover	633/01	SPZ	17	Recreation Site (East Kiewa Pack Tk)
Buckland South	635/01	SPZ	270	Recreation Site (Buckland River)
	635/02	SMZ	535	Long Footed Potoroo
	635/03	SMZ	13	VROT Flora (*Eucalyptus neglecta*)
	635/04	SMZ	13	VROT Flora (*Eucalyptus neglecta*)
	*635/05	SMZ	1	Long Footed Potoroo
	635/06	SMZ	11	VROT Flora (*Billardiera scandens* var. *brachyantha*), Recreation Site (Buckland River)
Clear Ck	636/01	SPZ	2 423	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland), VROT Flora (*Eucalyptus neglecta*), Recreation Site (Buckland River)
	636/02	SPZ	1 695	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland), Recreation Site (Buckland River)
	636/03	SMZ	84	Smoky Mouse
	636/04	SMZ	12	VROT Flora (*Desmodium varians*)
	*636/05	SMZ	9	VROT Flora (*Eucalyptus neglecta*)
	636/06	SMZ	13	VROT Flora (*Cyperus flavidus, Eucalyptus neglecta, Billardiera scandens* var. *brachyantha*)
	*636/07	SPZ	2	EVC protection (Riparian Mosaic – North East)
	*636/08	SPZ	2	EVC protection (Treeless Sub-alpine Mosaic)
West Ovens	637/01	SPZ	273	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Historic Site (Rose Thistle & Shamrock Batterys)
	*637/02	SPZ	7	Historic Site (Rose Thistle & Shamrock Workings)
	637/03	SMZ	455	Designated Catchment (Ovens River West Branch), Long Footed Potoroo
	637/04	SPZ	36	EVC protection (Riparian Forest)
	*637/05	SPZ	3	Historic Site (Gun Extended Battery)
	*637/06	SPZ	3	Historic Site (Guns Battery)
	*637/07	SPZ	3	EVC protection (Treeless Sub-alpine Mosaic)
	*637/08	SPZ	2	EVC protection (Riparian Forest/Swampy, Riparian Woodland Mosaic), Historic Site (Landy Jane Battery & Sambas Mine)
East Ovens	638/01	SPZ	490	Sooty Owl
	638/02	SMZ	132	Long Footed Potoroo
	*638/03	SMZ	4	Long Footed Potoroo
West Kiewa South	639/01	SPZ	583	Spotted Tree Frog, EVC protection (Wet Forest), VROT Flora (*Acacia dallachiana, Persoonia subvelutina*)
	*639/02	SPZ	4	EVC protection (Wet Forest)
	639/03	SMZ	1 143	Designated Catchment (West Kiewa River), Spotted Tree Frog, VROT Flora (*Acacia dallachiana, Persoonia subvelutina*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Teatree North	646/01	SMZ	1 410	Long Footed Potoroo, VROT Flora (*Acacia alpina, Aciphylla glacialis, Eucalyptus mitchelliana, Pterostylis aestiva, Ranunculus eichlerianus, Ranunculus gunnianus, Stackhousia pulvinaris, Grevillea victoriae s.s.*)
	646/02	SMZ	97	Smoky Mouse
	646/03	SMZ	105	Smoky Mouse
	646/04	SPZ	942	Sooty Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Long Footed Potoroo
	646/05	SPZ	158	EVC protection (Riparian Forest)
	646/06	SMZ	11	VROT Flora (*Ranunculus eichlerianus*)
	646/07	SPZ	269	Remote & Natural Area, Old-growth values (Shrubby Dry Forest, Montane Dry Woodland)
	*646/08	SMZ	8	Long Footed Potoroo
	*646/09	SPZ	5	EVC protection (Riparian Forest)
	646/10	SMZ	13	VROT Flora (*Acacia alpina, Eucalyptus mitchelliana*)
	646/11	SMZ	1 803	Long Footed Potoroo
Teatree South	647/01	SPZ	3 151	EVC protection (Riparian Forest), Old-growth values (Heathy Dry Forest, Herb-rich Foothill Forest)
	647/02	SPZ	182	Wildlife corridor, EVC protection (Riparian Forest), Long Footed Potoroo
	647/03	SMZ	116	Smoky Mouse
	647/04	SMZ	415	Long Footed Potoroo
	647/05	SPZ	1 001	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest), Sooty Owl, Long Footed Potoroo
	647/06	SMZ	2 406	Long Footed Potoroo, Smoky Mouse
	647/07	SPZ	50	EVC protection (Riparian Forest)
	*647/08	SPZ	7	EVC protection (Riparian Forest)
	*647/09	SPZ	7	EVC protection (Riparian Forest)
	647/10	SMZ	212	Long Footed Potoroo
Lawson	660/01	SPZ	387	Bandy Bandy, Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest)
	*660/02	SPZ	2	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*660/03	SPZ	7	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	660/04	SPZ	1 210	EVC protection (Shrubby Dry Forest, Rocky Outcrop Shrubland/Herbland Mosaic), Barking Owl
	*660/05	SPZ	5	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*660/06	SPZ	8	EVC protection (Valley Grassy Forest)
	*660/07	SPZ	2	EVC protection (Swampy Riparian Woodland)
Burrowye	661/01	SPZ	625	Old-growth values (Herb-rich Foothill Forest)
	661/02	SPZ	82	EVC protection (Valley Grassy Forest)
	661/03	SPZ	10	EVC protection (Rocky Outcrop Shrubland/Herbland Mosaic)
	*661/04	SPZ	5	EVC protection (Swampy Riparian Woodland)
	*661/05	SPZ	3	VROT Flora (*Desmodium varians*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Walwa	662/01	SPZ	29	EVC protection (Valley Grassy Forest)
	662/02	SPZ	76	EVC protection (Grassy Woodland)
	662/03	SPZ	27	EVC protection (Valley Grassy Forest)
Koetong	663/01	SPZ	16	EVC protection (Valley Grassy Forest)
	*663/02	SPZ	4	EVC protection (Swampy Riparian Woodland)
	663/03	SPZ	13	VROT Flora (*Corybas hispidus, Dodonaea rhombifolia, Grevillea polybractea, Juncus brevibracteus, Pimelea treyvaudii, Pomaderris subcapitata, Prasophyllum canaliculatum*)
Lucyvale	666/01	SPZ	2 851	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest, Damp Forest), EVC protection (Riparian Forest, Riparian Mosaic – North East), Historic Site (Lucky Hit Sawmill)
	*666/02	SPZ	9	EVC protection (Riparian Mosaic – North East)
	666/03	SPZ	131	EVC protection (Riparian Mosaic – North East)
	*666/04	SPZ	6	EVC protection (Riparian Forest)
	666/05	SPZ	77	EVC protection (Riparian Mosaic – North East), VROT Flora (*Callitriche umbonata, Pimelea treyvaudii, Pterostylis laxa*)
	666/06	SMZ	6	VROT Flora (*Callitriche umbonata, Pimelea treyvaudii, Pterostylis laxa*)
Goulds	667/01	SPZ	11	EVC protection (Swampy Riparian Woodland)
	*667/02	SPZ	3	EVC protection (Valley Grassy Forest)
Bullioh	668/01	SPZ	259	EVC protection (Heathy Dry Forest, Herb-rich Foothill Forest)
	668/02	SPZ	373	EVC protection (Shrubby Dry Forest, Herb-rich Foothill Forest), VROT Flora (*Genoplesium nudum, Scleranthus fasciculatus*)
Fernvale	670/01	SPZ	1 416	Old-growth values (Grassy Dry Forest, Herb-rich Foothill Forest), VROT Flora (*Acacia deanei Acacia flexifolia, Isolepis congrua, Pultenaea foliolosa, Pultenaea platyphylla, Eucalyptus sideroxylon s.s.*)
	670/02	SPZ	326	EVC protection (Shrubby Dry Forest, Herb-rich Foothill Forest), Old-growth values (Shrubby Dry Forest)
	*670/03	SPZ	7	Powerful Owl
	670/04	SMZ	13	VROT Flora (*Billardiera scandens* var. *brachyantha, Poa sieberiana var. cyanophylla*)
Bonegilla	671/01	SPZ	634	EVC protection (Shrubby Dry Forest, Herb-rich Foothill Forest), Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest), Historic Site (Grasshopper Battery)
	671/02	SPZ	56	Powerful Owl
Gundowring	672/01	SPZ	6 216	Powerful Owl, Sooty Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	672/02	SPZ	149	Powerful Owl
	*672/03	SMZ	7	VROT Flora (*Astrotricha linearis*)
	*672/04	SPZ	1	EVC protection (Riparian Forest)
	672/05	SPZ	37	EVC protection (Riparian Mosaic – North East)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Bullhead	673/01	SPZ	1 103	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	673/02	SPZ	269	EVC protection (Valley Grassy Forest)
	*673/03	SPZ	3	Bent Wing Bat
	*673/04	SPZ	4	EVC protection (Riverine Escarpment Scrub)
	*673/05	SPZ	6	EVC protection (Riparian Forest)
	673/06	SMZ	10	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	673/07	SMZ	13	VROT Flora (*Billardiera scandens* var. *brachyantha*)
Wyeebo	674/01	SPZ	37	EVC protection (Valley Grassy Forest)
	*674/02	SPZ	1	EVC protection (Valley Grassy Forest)
	*674/03	SPZ	< 1	EVC protection (Valley Grassy Forest)
Mt Cudgewa	675/01	SPZ	1 273	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Damp Forest), EVC protection (Riparian Forest)
	675/02	SPZ	32	EVC protection (Riparian Forest)
	675/03	SPZ	55	EVC protection (Riparian Forest)
	675/04	SPZ	31	EVC protection (Montane Riparian Thicket)
	675/05	SPZ	17	EVC protection (Montane Riparian Thicket)
	675/06	SPZ	16	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest, Damp Forest), EVC protection (Riparian Forest, Riparian Mosaic – North East)
	675/07	SMZ	12	VROT Flora (*Dodonaea rhombifolia*)
	*675/08	SPZ	< 1	Historic Site (Rogers Creek logging huts)
Cravensville	676/01	SPZ	24	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Damp Forest)
	676/02	SPZ	37	EVC protection (Riparian Forest)
	676/03	SPZ	56	EVC protection (Riparian Mosaic – North East)
	676/04	SPZ	268	EVC protection (Montane Riparian Thicket)
	676/05	SPZ	10	VROT Flora (*Carex archeri, Dodonaea rhombifolia, Thelymitra simulata, Diuris dendrobioides, Acacia lanigera* var. *lanigera*)
	676/06	SMZ	2	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
Mt Benambra	677/01	SPZ	2 023	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest, Heathy Dry Forest, Grassy Dry Forest)
	677/02	SPZ	28	EVC protection (Riparian Mosaic – North East)
	677/03	SMZ	255	Designated Catchment (Mt Tabor Ck)
	677/04	SPZ	33	EVC protection (Riverine Escarpment Scrub)
	677/05	SPZ	126	EVC protection (Riverine Escarpment Scrub, Riparian Mosaic – North East)
	*677/06	SPZ	4	EVC protection (Riparian Mosaic – North East)
	*677/07	SPZ	< 1	EVC protection (Riverine Escarpment Scrub)
	*677/08	SPZ	< 1	EVC protection (Valley Grassy Forest)
Mitta	678/01	SPZ	97	EVC protection (Riparian Mosaic – North East), VROT Flora (*Acacia dawsonii*), Historic Site (sluice mining)
	678/02	SPZ	109	EVC protection (Riparian Mosaic – North East), Historic Site (Grand Junction sluicing claim)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
	678/03		661	EVC protection (Valley Grassy Forest)
	678/04	SPZ	11	EVC protection (Valley Grassy Forest)
	678/05	SPZ	13	EVC protection Flora Site (*Euphrasia scabra*)
	*678/06	SPZ	9	EVC protection (Floodplain Riparian Woodland)
	*678/07	SPZ	1	Historic Site (Enever's Claim)
	678/08	SMZ	12	VROT Flora (*Acacia dawsonii*)
	678/09	SMZ	13	VROT Flora (*Acacia dawsonii*)
Lord	679/01	SPZ	2 102	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), VROT Flora (*Ammannia multiflora*)
	679/02	SPZ	264	EVC protection (Riparian Mosaic – North East)
	679/03	SPZ	49	EVC protection (Riparian Forest), Historic Site (Hodgkins Hut)
	679/04	SPZ	35	Recreation Site (Deep Gully & River Walks), Mountain Galaxias
	*679/05	SPZ	1	Historic Site (Eucalypt Species Trial Plot)
	*679/06	SPZ	1	Historic Site (Tin Mine)
	679/07	SMZ	10	VROT Flora (*Acacia dawsonii*)
	679/08	SMZ	7	VROT Flora (*Discaria pubescens*)
	*679/09	SMZ	4	VROT Flora (*Pimelea trevaudii*)
	679/10	SMZ	13	VROT Flora (*Acacia dallachiana*)
	679/11	SPZ	113	Recreation Site (Mt Welcome Walking Tk)
	*679/12	SPZ	1	Recreation Site (Deep Gully & River Walks)
Granite Peak	680/01	SPZ	711	EVC protection (Valley Grassy Forest), Recreation Site (Snowy Ck)
	680/02	SPZ	529	Powerful Owl, Old-growth values (Damp Forest, Shrubby Dry Forest, Herb-rich Foothill Forest)
	680/03	SPZ	450	Spotted Tree Frog, Historic Site (Lightning Ck diggings)
	680/04	SMZ	538	Spotted Tree Frog
	*680/05	SPZ	< 1	Historic Site (Granite Peak Mine)
Dartmouth	681/01	SPZ	29	Powerful Owl
Razorback	682/01	SPZ	12	Site of Significance (SOS No 1)
	682/02	SPZ	31	VROT Flora (*Eucalyptus glaucescens*, *Poa petrophila*), Site of Significance (SOS No 2)
	682/03	SPZ	26	Site of Significance (SOS No 3)
	682/04	SMZ	3	VROT Flora (*Eucalyptus glaucescens*)
Lightning	683/01	SMZ	264	Spotted Tree Frog
	683/02	SPZ	189	Spotted Tree Frog, Historic Site (Lightning Ck diggings)
	683/03	SMZ	13	VROT Flora (*Pomaderris aurea*)
	*683/04	SPZ	< 1	Historic Site (Battery)
	*683/05	SPZ	< 1	Historic Site (Lightning Ck Mine)
	*683/06	SPZ	1	Historic Site (Hopeful & Mt Merriac Battery, Mine)
	*683/07	SPZ	1	Historic Site (Battery & Mine)
	*683/08	SPZ	< 1	Historic Site (Battery & Mine, CRB Hut)
	683/09	SMZ	12	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	683/10	SMZ	13	VROT Flora (*Scleranthus fasciculatus*)
Sunnyside	*684/01	SPZ	6	EVC protection (Riparian Forest)
	684/02	SPZ	107	Recreation Site (Australian Alps Walking Tk)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Long Spur	685/01	SPZ	469	Spotted Tree Frog
	685/02	SMZ	532	Spotted Tree Frog
Snowy	686/01	SMZ	548	Spotted Tree Frog
	686/02	SPZ	652	Spotted Tree Frog
	686/03	SPZ	13	VROT Flora (*Acacia dallachiana, Agrostis muelleriana, Colobanthus affinis, Deyeuxia crassiuscula, Diplaspis nivis, Euphrasia caudata, Leucopogon montanus, Luzula alpestris, Olearia frostii, Persoonia subvelutina, Pomaderris aurea, Ranunculus eichlerianus, Ranunculus gunnianus, Schizeilema fragoseum, Scleranthus singuliflorus, Stackhousia pulvinaris, Carex hypandra, Epacris celata*)
	686/04	SMZ	13	VROT Flora (*Acacia dallachiana*)
	686/05	SPZ	111	Recreation Site (Australian Alps Walking Tk)
Bull Hill	687/01	SPZ	611	Powerful Owl, Old-growth values (Shrubby Dry Forest)
	687/02	SPZ	1 216	Sooty Owl, Recreation Site (Lightning Ck)
	687/03	SMZ	753	Spotted Tree Frog
	687/04	SPZ	56	EVC protection (Riparian Mosaic – North East)
	687/05	SMZ	12	VROT Flora (*Ranunculus eichlerianus*)
	*687/06	SPZ	< 1	Historic Site (Mines)
	687/07	SPZ	13	VROT Flora (*Acacia dallachiana, Acacia dawsonii, Bossiaea riparia, Discaria pubescens, Euphrasia scabra, Hybanthus monopetalus, Leptospermum multicaule, Polygala japonica, Pomaderris aurea, Pultenaea polifolia, Thesium australe*)
Little Snowy	688/01	SPZ	889	Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest), EVC protection (Riparian Mosaic – North East)
	688/02	SPZ	491	Sooty Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), EVC protection (Riparian Forest)
	688/03	SPZ	135	EVC protection (Riparian Forest)
	688/04	SPZ	558	Sooty Owl, Historic Site (Saxey Creek Mine & Hut), Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	688/05	SPZ	37	EVC protection (Riparian Forest)
	688/06	SPZ	18	EVC protection (Swampy Riparian Woodland)
	688/07	SPZ	23	EVC protection (Shrubby Dry Forest, Herb-rich Foothill Forest), Old-growth values (Herb-rich Foothill Forest, Shrubby Dry Forest), Historic Site (Grasshopper Battery Site)
	*688/08	SPZ	1	EVC protection (Valley Grassy Forest), Historic Site (Mine)
	688/09	SMZ	13	VROT Flora (*Acacia dallachiana, Acacia dawsonii, Alchemilla sp., Ammannia multiflora*)
	688/10	SMZ	13	VROT Flora (*Acacia dallachiana*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Eskdale	689/01	SPZ	6 444	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest), Historic Site (Mine)
	*689/02	SPZ	2	EVC protection (Valley Grassy Forest)
	*689/03	SPZ	1	EVC protection (Plains Grassy Woodland/Floodplain Riparian Woodland Complex)
	*689/04	SPZ	1	EVC protection (Plains Grassy Woodland/Floodplain Riparian Woodland Complex)
Pine Mountain	690/01	SPZ	161	Old-growth values (Heathy Dry Forest, Grassy Dry Forest)
Jemba	*691/01	SPZ	2	EVC protection (Valley Grassy Forest)
Wabba	693/01	SPZ	1 071	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	693/02	SPZ	19	EVC protection (Swampy Riparian Woodland)
	693/03	SPZ	25	EVC protection (Swampy Riparian Woodland)
	*693/04	SPZ	3	Historic site (Dumbrell sawmill and timber tramway)
	693/05	SPZ	41	EVC protection (Riparian Forest)
	693/06	SPZ	80	Powerful Owl
	693/07	SPZ	11	Mountain Galaxias
	693/08	SMZ	12	VROT Flora (*Pterostylis aestiva, Poa sieberiana* var. *cyanophylla*)
	693/09	SMZ	13	VROT Flora (*Grevillia willisii*)
	*693/10	SPZ	3	EVC protection (Riverine Escarpment Scrub)
	*693/11	SPZ	1	Historic Site (Embery's Sawmill)
	*693/12	SPZ	1	EVC protection (Riparian Forest)
	*693/13	SPZ	7	EVC protection (Riparian Forest)
	693/14	SMZ	8	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
Elliot	694/01	SPZ	198	Old-growth values (Shrubby Dry Forest)
	694/02	SPZ	16	EVC protection (Valley Grassy Forest)
	694/03	SPZ	52	EVC protection (Valley Grassy Forest)
	*694/04	SPZ	1	Recreation Site (Mt Elliot)
	*694/05	SPZ	< 1	Historic Site (Mt Elliot Mine, hut)
	*694/06	SPZ	< 1	EVC protection (Valley Grassy Forest)
	*694/07	SPZ	9	EVC protection (Valley Grassy Forest, Floodplain Riparian Woodland)
Nariel	695/01	SPZ	1 906	Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest)
	695/02	SPZ	1 986	Powerful Owl, EVC protection (Riparian Forest, Riparian Mosaic – North East)
	695/03	SPZ	1 156	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Montane Dry Woodland)
	*695/04	SPZ	8	EVC protection (Montane Riparian Thicket)
	*695/05	SPZ	9	EVC protection (Riverine Escarpment Scrub)
	695/06	SPZ	101	EVC protection (Riparian Forest)
	695/07	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	695/08	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	695/09	SMZ	11	VROT Flora (*Grevillea willisii, Pimelea treyvaudii, Prasophyllum patens, Austrodanthonia pilosa* var. *paleacea, Poa sieberiana* var. *cyanophylla*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Bunroy	696/01	SPZ	718	Powerful Owl, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	696/02	SPZ	3 502	Powerful Owl, Barking Owl, Old-growth values (Heathy Dry Forest, Shrubby Dry Forest, Herb-rich Foothill Forest), Historic Site (Thowgla Ck alluvial workings), Recreation Site (Bullocky Crossing & Tunnel Bend)
	696/03	SPZ	30	EVC protection (Riparian Forest, Valley Grassy Forest)
	696/04	SPZ	1 353	Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest)
	696/05	SPZ	507	Powerful Owl, Old-growth values (Shrubby Dry Forest)
	696/06	SPZ	49	EVC protection (Riparian Forest)
	696/07	SPZ	13	EVC protection (Swampy Riparian Woodland)
	696/08	SPZ	12	EVC protection (Valley Grassy Forest)
	*696/09	SPZ	1	EVC protection (Valley Grassy Forest)
Dart	697/01	SPZ	808	EVC protection, Old-growth values (Shrubby Dry Forest, Herb-rich Foothill Forest, Damp Forest)
	697/02	SPZ	14	EVC protection (Swampy Riparian Woodland)
	697/03	SPZ	15	EVC protection (Montane Riparian Thicket), VROT Flora (*Poa sieberiana* var. *cyanophylla*), Recreation Site (Knockwood Reserve)
	697/04	SMZ	10	VROT Flora (*Spiranthes sinensis*, *Poa sieberiana* var. *cyanophylla*)
	697/05	SMZ	10	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	697/07	SMZ	4	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
Zulu	698/01	SPZ	5 170	Powerful Owl, EVC protection (Riparian Forest), Old-growth values (Shrubby Dry Forest, Heathy Dry Forest, Montane Dry Woodland), Spotted Tree Frog, VROT Flora (*Poa sieberiana* var. *cyanophylla*), Historic Site (Wheelers Ck Hut), Recreation Site (O'Hagans & Paddy Joy)
	698/02	SPZ	412	Spotted Tree Frog, Historic Site (Wild Boar Mine & battery)
	698/03	SMZ	182	Wildlife corridor
	*698/04	SMZ	7	Flora Site (*Euphrasia caudata*)
	*698/05	SPZ	2	EVC protection (Riparian Forest)
	*698/06	SPZ	1	Recreation Site (Upper Murray Ski Hut)
	*698/07	SPZ	8	Historic Site (Carmody's Hut and Yards)
	698/08	SMZ	6	VROT Flora (*Austrodanthonia pilosa* var. *paleacea*, *Poa sieberiana* var. *cyanophylla*)
Boebuck	699/01	SPZ	2 554	Spot-tailed Quoll, Old-growth values (Damp Forest, Wet Forest), EVC protection (Riparian Forest, Montane Riparian Thicket), VROT Flora (*Pterostylis fischii*)
	*699/02	SPZ	4	EVC protection (Montane Riparian Thicket)
	*699/03	SPZ	4	EVC protection (Montane Riparian Thicket)
	*699/04	SPZ	8	EVC protection (Montane Riparian Thicket)
	699/05	SPZ	59	EVC protection (Riparian Forest, Montane Riparian Thicket)
	699/06	SMZ	13	VROT Flora (*Epilobium pallidiflorum*)
	699/08	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)

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Zoning Scheme Register for the North East continued

Block Name	Block/Site	Zone	Area[1] (ha)	Attributes[2]
Pinnibar	700/01	SPZ	2 587	Sooty Owl, Old-growth values (Damp Forest, Montane Dry Woodland, Montane Damp Forest),
	700/02	SPZ	223	Wildlife corridor, Recreation Site (Paddy Joy)
	700/03	SPZ	11	EVC protection (Montane Riparian Thicket)
	700/04	SPZ	984	EVC protection (Montane Riparian Thicket), Spotted Tree Frog, EVC protection (Montane Riparian Thicket)
	700/05	SMZ	333	Spotted Tree Frog
	700/06	SPZ	925	Old-growth values (Herb-rich Foothill Forest, Montane Dry Woodland, Montane Damp Forest, Sub-alpine Woodland)
	*700/07	SPZ	1	Historic and Recreation Sites – Dunstan Logging Huts
	*700/08	SPZ	1	Historic and Recreation Site – Mt Pinnibar (Gibsons Hut)
	700/09	SPZ	13	VROT Flora (*Euphrasia caudata, Juncus falcatus, Leucopogon attenuatus, Pterostylis oreophila, Uncinia nemoralis, Pimelea ligustrina* ssp. *ciliata, Poa sieberiana* var. *cyanophylla, Grevillea brevifolia*)
Saltpetre	701/01	SPZ	2 289	Old-growth values (Heathy Dry Forest, Herb-rich Foothill Forest), EVC protection (Herb-rich Foothill Forest, Montane Dry Woodland, Heathy Dry Forest, Wet Forest), Sooty Owl, VROT Flora (*Acacia dallachiana, Australopyrum retrofractum, Euphrasia caudata, Leucopogon attenuatus, Poa sieberiana var. cyanophylla*), Historic Sites (Golden Treasure battery & grave), Sites of Significance (SOS NO: 4,5,1)
	*701/02	SPZ	75	Site of Significance (SOS No. 8)
	701/03	SMZ	12	VROT Flora (*Acacia dallachiana*), Historic Site (Lady Loch Mine)
	*701/04	SPZ	1	Historic Site (Cribbage Creek Alluvial Gold Mine)
	*701/05	SMZ	13	VROT Flora (*Acacia dallachiana*), Historic Site (Lady Loch Mine)
	*701/06	SMZ	2	VROT Flora (*Acacia dallachiana*)
	*701/07	SMZ	1	VROT Flora (*Euphrasia caudata*)
	*701/08	SMZ	6	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
	701/09	SMZ	14	VROT Flora (*Leucopogon attenuatus*)
	701/10	SMZ	13	VROT Flora (*Poa sieberiana* var. *cyanophylla*)
Larsen	702/01	SMZ	10	VROT Flora (*Poa sieberiana* var. *cyanophylla*)

Notes:

1 All areas are rounded to the nearest 1 ha (see Explanatory Notes on page 7).

2 Attributes listed in the table are those values most significant to each individual SPZ or SMZ. For example, in an SPZ, not all EVCs that are protected are listed, unless they are considered a major value of the zone.

APPENDIX D

DESCRIPTION OF GEOGRAPHIC REPRESENTATION UNITS

Geographic Representation Unit (GRU)	Description
Barry Mountains	Montane to sub-alpine steep sided ranges dissected by broad, fertile river valleys. River valleys of Quaternary alluviums. Ranges dominated by Ordovician marine sediments with Devonian granites and other volcanics, Devonian sediments and Carboniferous sediments. Rainfall high to very high. Forest types are predominantly Herb-rich Foothill Forest, Shrubby Dry Forest and Montane Dry Woodland. A significant proportion of the rare EVCs Riparian Shrubland, Swampy Riparian Woodland and Swampy Riparian Woodland occur on this unit.
Big Ben Foothills	Dissected foothills and steep-sided low mountains. Devonian and Silurian granites and Silurian metamorphics with smaller areas of Ordovician sediments. Rainfall low to very high. A large proportion of this unit consists of Herb-rich Foothill Forest, Shrubby Dry Forest and the rare EVC Grassy Dry Forest. Granitic Hills Woodland is also significant here.
Big River Mountains	Mountain ranges steeply dissected by broad, fertile valleys of major rivers. River valleys with Quaternary alluviums. Ranges dominated by Devonian and Ordovician sediments with Carboniferous sediments, Devonian granites and granodiorites, Devonian metamorphics and Tertiary basalts. Rainfall high to very high, supporting Herb-rich Foothill Forests, Shrubby Dry Forests and Montane Dry Forests. Rare EVCs occurring here include Riparian Shrubland and Grassy Dry Forest. The only unit containing Heathy Woodland within the North East Area.
Bogong Mountains	Steeply dissected ranges and alpine /sub-alpine plateaux with complex faulting. Ordovician metamorphics with smaller areas of Silurian / Ordovician granite / granodiorite and plateaux outcrops of Tertiary basalt. Rainfall high to very high. Montane Dry Woodland, Sub-alpine Woodlands and the rare EVC Treeless Sub-alpine Mosaic, with 88% of its distribution throughout the North East occurs in this unit.
Buffalo Mountains	Steep sedimentary hills (Mt Buffalo granite massif the most dominant feature) and narrow river valleys with restricted flats. Ordovician sediments with Devonian granites. Rainfall low to very high. Dominant forest types include Shrubby Dry Forest, Herb-rich Forest and the rare EVC Riparian Shrubland, with 70% of its distribution for the North East Region occurring in this unit.
Corryong Foothills	Three distinct mountain ranges of Devonian granite and Devonian acid volcanics interspersed by broad valleys of Quaternary sediments and older alluvial terraces no longer subject to flooding. Rainfall low to high. Dominant forest types include Heathy Dry Forest and Herb-rich Foothill Forest. This unit also supports the only known records of Floodplain Riparian Woodland/Plains Grassy Woodland for the North East region. Other rare EVCs include Granitic Hills Woodland, Grassy Dry Forest and Valley Grassy Forest.

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Description of Geographic Representation Units continued

Geographic Representation Unit (GRU)	Description
Dartmouth Mountains	Steeply dissected ranges and sub-alpine areas. Dominated by Ordovician and Silurian sediments with substantial areas of Silurian acid volcanics and a small area of Ordovician granodiorite. Rainfall high to very high. Dominant forest types include Shrubby Dry Forest and Herb-rich Foothill Forest. This unit supports the following rare EVCs; Riparian Forest, Grassy Dry Forest and Valley Grassy Forest, with Treeless Sub-alpine Mosaic occurring at higher altitudes.
Delatite Valley	Undulating foothills, fertile plains and river flats to dissected mountain ranges in the east. Foothills and ranges predominantly Carboniferous sediments with Devonian sediments, Devonian metamorphics and Devonian volcanics. Broad river valleys of Quaternary alluviums. Rainfall moderate to high. Dominant forest types occurring in this unit include Herb-rich Foothills and Shrubby Dry Forest. Rare EVCs supported by this unit include Grassy Dry Forest and Riparian Forest
Granya Foothills	Low rolling hills of Silurian and Devonian granites to the east of the unit with Ordovician metamorphics west of Bullioh. Rainfall low to high. This unit supports a significant amount of the rare EVC Clay Heathland, with 85% of its distribution for the North East Region occurring in this unit. Dominant forest types include; Shrubby Dry Forest, Heathy Dry Forest, Herb-rich Foothill Forest and the rare Granitic Hills Woodland.
Highlands Foothills	Kobyboyn and Callen Ranges, gently rolling hills of Devonian Granite with minor Devonian and Silurian sediments. Rainfall generally moderate. Herb-rich Foothill Forest dominates the forested areas of this unit, while a significant proportion of rare EVCs Plains Grassy Woodland and Floodplain Riparian Woodland also occurs.
King River Floodplain	Plain of recent Quaternary sediments (mostly alluvial) and low hills of Ordovician sediments. Rainfall low to high. The rare EVC Grassy Dry Forest makes up half of the forested areas in this unit. Herb-rich Foothill Forest and Heathy Dry Forest are also significant with Valley Grassy Forest.
Matlock Mountains	Steeply dissected ranges. Devonian and Silurian sediments. Rainfall low to moderate. Shrubby Dry Forest Herb-rich Foothill Forest, Montane Dry Woodland and Damp Forest dominate here.
Mitta Foothills	Dissected hills. Equally dominated by Ordovician metamorphics and sediments with smaller areas of Silurian granite and granodiorite with Quaternary sediments along major streams. Rainfall high to very high. Herb-rich Foothill Forest and Shrubby Dry Forest are dominant forest types in this unit. A significant proportion of Plains Grassy Woodland and Riparian Mosaic-North East also occurs.
Mt Pilot Foothills	Low, gentle foothills of Devonian granite and narrow plains of Quaternary alluvial sediments with substantial colluvial sediments on the footslopes above plains. Contains substantial areas of alluvial plains through which rise low Ordovician sedimentary hills (Chiltern area). Rainfall low to high. The rare EVCs Dry Grassy Forest, Box Ironbark Forest, Granitic Hills Woodland and Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic dominate the forested areas, along with Heathy Dry Forest. The only unit containing Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex, Montane Damp Forest/Montane Wet Forest Mosaic, Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic and Alluvial Terraces Herb-rich Woodland within the North East Area.
Pinnibar Mountains	Steeply dissected ranges. Ordovician sediments and substantial Ordovician/Silurian granodiorites and smaller areas of Ordovician metamorphics. Rainfall generally very high. Herb-rich Foothill Forest, Shrubby Dry Forest and Montane Dry Woodlands are significant forest types.

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Description of Geographic Representation Units continued

Geographic Representation Unit (GRU)	Description
Strathbogie Foothills	Steep hills rising from plains and broad granite plateaux. Devonian acid volcanics and granites. Rainfall moderate to high on the granite plateau of Strathbogie Ranges, with the decline running northwards. Herb-rich Foot Hill Forest dominates forested areas. Other significant EVCs include; Heathy Dry Forest and the rare EVC Grassy Dry Forest. This is also the only unit containing Perched Boggy Shrubland and Gilgai Plain Woodland/Wetland/Heathy Dry Forest Mosaic within the North East Area.
Tallangatta Foothills	Moderately steep hills dominated by Silurian granite, granodiorites. Rainfall high to very high. The forest types are dominated by Herb-rich Foot Hill Forest and Shrubby Dry Forest. This also supports a significant area of Montane Riparian Thicket and Riverine Escarpment Scrub.
Toombullup Foothills	Low, rolling hills and steep-sided foothill plateaux and Quaternary alluvial plains. Geology/lithology is complex and includes Devonian granites, acid volcanics, Ordovician sediments, Carboniferous sediments, Tertiary volcanics and Cambrian greenstones. Rainfall low to high, declining northwards. Herb-rich Foot Hills is the dominant forest type in this unit. Other significant EVCs include; Grassy Dry Forest, Heathy Dry Forest, Shrubby Dry Forest and Damp Forest.
Upper King Mountains	Steeply dissected ranges and broad, fertile river valleys. Ranges predominantly Devonian volcanics and Ordovician sediments with Devonian metamorphics, Tertiary basalt volcanics and Carboniferous sediments. River valleys quaternary alluviums. Rainfall high. Herb-rich Foot Hills and Shrubby Dry Forest make up a large proportion of the forested area in this unit. This is also the only unit containing Valley Heathy Forest within the North East Area.

Note: Rainfall is classified as low (<700mm), moderate (700–1000mm), high (1000–1200m) or very high (>1200mm).

APPENDIX E

DESCRIPTION OF ECOLOGICAL VEGETATION CLASSES IN THE NORTH EAST

The following brief description of the Ecological Vegetation Classes (EVC) occurring in State forest is adapted from the Comprehensive Regional Assessment for the North East (VicRFASC 1998a).

Herbland Vegetation

Spring Soak Herbland

Spring Soak Herbland is a wetland community that is dependent upon continual availability of a reliable water supply. Although predominantly a herbland, sedges and rushes are common. Herbaceous species common to this EVC include Narrow Goodenia (*Goodenia macbarronii*), Common Onion Grass (*Romulea rosea*) and Square Cicienda (*Cicienda quadrangularis*). Some sites have a eucalypt overstorey which may include Blakely's Red Gum (*Eucalyptus blakelyi*), Warby Swamp Gum (*E cadens*) and Long-leaf Box (*E. goniocalyx/E. nortonii*).

Heathland and Thicket Vegetation

Clay Heathland

This EVC occurs mainly in very small, isolated patches on northern and western aspects. Leucocratic granite underlies this community forming a clayey soil. Tree species are often stunted (<20m) and sparse. These include, Broad-leaf Peppermint (*E. dives*), Red Stringybark (*E. macrorhyncha*) and Brittle Gum (*E. mannifera*). A diverse shrub layer includes Dwarf Boronia (*Boronia nana* var. *hyssopifolia*), Violet Kunzea (*Kunzea parvifola*), Prickly Tea-tree (*Leptospermum continentale*) and Silver Banksia (*Banksia marginata*). Many other small shrubs, forbs and grasses also occur.

Montane Riparian Thicket

The riparian zones of Montane Damp Forest and other areas where cold air pockets mimic the climate of montane environments support this EVC. The overstorey consists of eucalypts characteristic of Montane environments. Beneath these taller eucalypts, a tall dense shrub layer occurs with small eucalypts such as Narrow-leafed Peppermint (*E. radiata*) and Manna Gum (E. *viminalis*) accompanied by dense thickets of Mountain Tea-tree (*L. grandifolium*). The groundlayer consists of ferns, grasses and forbs.

Woodland Vegetation

Heathy Woodland

Long-leaf Box (*E. gonicocalyx* s.l) dominates the over storey of this low, open woodland, which attain a height of approximately ten metres. A high diversity of pea and epacrid species can be found in the understorey, including Parrot Peas (*Dillwynia* spp.), Guinea Flower (*Hibbertia* spp.) Daisy (*Asteraceae*) and Beard-heath (*Leucopogon* spp.).

Grassy Woodland

Four floristic communities can be found within this EVC including, Rainshadow Grassy Woodland, Foothill Grassy Woodland, Shrubby Granitic-outwash Grassy Woodland and Slopes Box Grassy Woodland. These vary in floristic composition, but have similar structural characteristics. The overstorey occurs as woodland to open forest. Species that dominate this strata include Blakely's Red Gum (*E. blakelyi*) and White Box (*E. albens*) in the Rainshadow Grassy Woodland, and Narrow-leaf Peppermint (*E. radiata*), Broad-leaf Peppermint (*E. dives*), Brittle Gum (*E. mannifera*) and Eurabbie (*E. globulus* spp. *bicostata*) in the Foothill Grassy Woodland. Blakely's Red Gum (*E. blakelyi)* Red Stringybark (E. *macrorhyncha*), Red Box (*E. polyanthemos*), Long-leaf Box (*E. goniocalyx*) and White Box (*E. albens*) occur in the Shrubby Granitic-outwash Grassy Woodland, while Grey Box (*E. microcarpa*) and White Box (*E. albens*) occur in the Slopes Box Grassy Woodland. Wattles and peas dominate the low to medium height understorey. A diverse ground layer includes Kangaroo grass (*Themeda triandra*), Wallaby Grass (*A.* spp.), Bent Grass species (*Deyeuxia* spp.) and many Lily and Rush species.

Plains Grassy Woodland

This EVC is isolated to small linear areas where the rainfall is between 500 mm and 600 mm, where soils are heavily textured and seasonally inundated. The sparse overstorey consists of Grey Box (*E. microcarpa*), White Box (*E. albens*) and Yellow Box (*E. melliodora*) in the west of the study area, and River Red Gum (*E. camaldulensis*) further east. A very sparse shrublayer, consisting of wattle species occurs above a highly diverse ground layer. Many grass, sedge and lily species including Kangaroo Grass (*T. triandra*), Wallaby Grasses (*A.* spp.) and Tall Sedge (*Carax appressa*) occur. Weed species are common.

Floodland Riparian Woodland

Occurring along the banks of larger, slow-moving rivers, this woodland community has a medium to tall shrublayer of Silver Wattle (*Acacia dealbata*) and Tree Violet (*Hymenanthera dentata*) which is protected by a tall woodland canopy of Red Gum (*E. camaldulensis*). The ground cover on drier elevated banks consists mainly of Common Tussock Grass (*Poa labillardierei*), while on the wetter, lower banks, Common Reeds (*Phragmites austalis*) and various Rush (*Juncus* spp.) and Sedge species (*Cyperaceae*) occur. Environmental weeds are prominent.

Creekline Grassy Woodland

Occurring along creek lines and on floodplains, this EVC relies on highly fertile alluvial soils, where seasonal inundation allows high moisture availability. River Red Gum (*E. camaldulensis*) dominates the overstorey, with other species including Mountain Swamp Gum (*E. camphora*), Warby Swamp Gum (*E. cardens*) and Blue Gum (*E. globulus*) occurring. A sparse to dense grassy ground layer is dominated by Tussock grasses (*Poa* spp), Rushes (*Juncus* spp.) and Flat-sedges (*Cyperus* spp.). Many weed species occur in this EVC.

Swampy Riparian Woodland

Swampy Riparian Woodland is found growing on low slopes near streams and along broad drainage lines. The overstorey is dominated by Mountain Swamp Gum (*E. camphora*) creating a woodland structure. Many other eucalypt species can be present. Shrub species occurring within this EVC include Blackwood (*A. melanoxylon*), Prickly Current-bush (*Coprosma. quadrifida*), Common Cassinia (*Cassinia aculeata*) and Silver Wattle (*A. dealbata*).

Granitic Hills Woodland

This EVC favours rocky outcrops and is restricted to granite and other intrusive igneous geologies. Granitic Hills Woodlands occur on Mount Pilot, Mount Lawson, Mount Granya and Mount Wombat. Overstorey is generally low woodland to 15m with Blakely's Red Gum (*E. blakelyi*) being the dominant species. Other Eucalypts including Red Stringybark (*E. macrorhyncha*) and Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii*) can be present. Black Cypress Pine (*Callitris endlicheri*) can be structurally dominant in areas sheltered from fire and clearing. Bryophytes are an important feature of Granitic Hills Woodlands, occurring on rocks and as soil crusts.

Alluvial Terraces Herb-rich Woodland

The majority of this EVC occurs in the Chiltern Box Ironbark National Park, with a small proportion occurring on private land. This EVC occurs on poorly-drained, sodic soils derived from Ordovician sediments or Tertiary alluvium. High water availability and the slightly higher fertility of these soils results in a ground layer dominated by herbs, forbs and grasses. These include, Grassland Wood-sorrel (*Oxalis perennans*), Stinking Penny-wort (*Hydrocotyle laxiflora*), Sheep's Spurr (*Acaena achinata*), Chocolate Lily (*Anthropodium stictum*) and a diverse range of herbs and rushes. The open overstorey is dominated by Yellow Box (*E. melliodora*) with Grey Box (*E. microcarpa*) often being co-dominant.

Sub-alpine Woodland

Sub-alpine Woodlands are common in the higher altitudes of the region. Usually dominated by Snow Gum (*E. pauciflora*), this community forms a woodland or forest that occurs on slopes ranging between elevations of 1300–1720 m. At the lower end of this range, Alpine Ash (*E. delegatensis*) and Mountain Gum (*E. dalrympleana*) may also occur. The understorey can vary from a dense to sparse shrublayer with a rich array of forbs and grasses. Shrubs include Alpine Podolobium (*Podolobium alpestre*), Leafy Bossiaea (*Bossiaea foliosa*), Dusty Daisy-bush (*O. phlogopappa*) and Alpine Pepper (*Tasmannia xerophila*).

Montane Dry Woodland

The drier, more exposed aspects of the mid to upper mountain slopes, at elevations greater than 1000 m support Montane Dry Woodland. This woodland or forest often extends onto the ridges. The overstorey ranges from 15 m to 25 m in height. Characteristic trees at the lower elevations include Broad-leaf Peppermint (*E. dives*), and Mountain Gum (*E. dalrympleana*), while Alpine Ash (*E. delegatensis*) is often present at higher altitudes. Shrubs tolerant of montane conditions can occur in sparse to dense cover. These include Hop Bitter-pea (*Daviesia latifolia*), Tree Lomatia (*Lomatia fraseri*), Mountain Pepper (*T. lanceolata*), Alpine Podolobium (*P. alpestre*) and Silver Wattle (*A. dealbata*).

Forest Vegetation

Grassy Dry Forest

This EVC has a scattered distribution throughout the region, occurring on lower slopes adjacent to farmland. Favouring drier northern or western aspects, Grassy Dry Forest often occurs on moderately fertile acidic duplex soils. Dominant overstorey species include Red Stringybark (*E. macrorhyncha*), Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii*) and Broad-leaf Peppermint (*E. dives*) which stand between 15 to 20 metres high. The diversity of the shrub stratum is characteristically low and may include Silver Wattle (*A. dealbata*), Honey Pots (*Actotriche serrulata*), Common Hovea (*Hovea linearis*) and Grey Guinea-flower (*H. obtusifolia*). Most of the species diversity for this EVC occurs in the ground cover, which can consist of up to 60 species of grasses, forbs and herbaceous species.

Valley Grassy Forest

Valley Grassy Forest occurs on fertile soils with good water retention capacity. It is limited within the North East because of clearing for agriculture. Restricted to gently undulating lower slopes, Valley Grassy Forest is often adjacent to or near private lands. It has a relatively high weed composition facilitated by a close proximity to agricultural lands. A mixture of Yellow Box (*E. melliodora*), Red Stringybark (*E. macrorhyncha*), White Box (*E. albens*) and Blakely's Red Gum *(E. blakelyi*) dominate the overstorey.

Riparian Forest

Riparian Forest is a tall forest of riverbanks and alluvial terraces. It tends to occur along quite swift-flowing streams. It is normally dominated by Manna Gum (*E. viminalis)*, with other eucalypts such as Narrow-leaf Peppermint (*E. radiata*) and Eurabbie (*E. globulus*. spp. *bicostata*). Silver Wattle (*A. dealbata*), Hazel Pomaderris (*Pomaderris aspera*), Tree Lomatia (*L. fraseri*) and Prickly Current-bush (*C. quadrifida*) dominate the shrub layer.

Herb-rich Foothill Forest

Herb-rich Foothill Forest occurs throughout the region, except at the highest and lowest elevations. This EVC favours mostly sheltered aspects, or exposed aspects where rainfall is high, such as plateau landforms. The canopy is 20 m to 25 m tall on drier sites and between 40 m to 50 m tall on moist sites. The overstorey consists of Narrow-leafed Peppermint (*E. radiata*) Eurabbie (*E. globulus spp. bicostata*), Mountain Gum (*E. dalrympleana*) and Broad-leaf Peppermint (*E. dives*) at drier localities. The diversity and high cover of forbs and grasses characterise this EVC. Species commonly occurring include Bidgee widgee (*A. nova-zelandiae*), Prickly Woodruff (*Asperula scoparia*), Ivy-leaf Violet (*Viola hederacea*), Austral Bear's-ears (*Cymbonotus preissianus*) and Common Woodrush (*Luzula meridionalis*).

Heathy Dry Forest

Common and wide spread, Heathy Dry Forest favours free-draining soils occurring on exposed northern and western slopes and ridge tops. It is dominated by a low canopy of Red Stringybark (*E. macrorhyncha*) and Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii*). Broad-leaf Peppermint (*E. dives*) and Red Box (*E. polyanthemos*) may be present. Low growing ericoid and small-leafed shrubs dominate the shrublayer. Rarely exceeding 0.5 metres these shrubs include Daphne Heath (*Brachyloma daphnoides*), Small-leafed Parrot-pea (*D. phylicoides*) and Silky Guinea-flower (*H. sericea*).

Shrubby Dry Forest

Shrubby Dry Forest is a widespread and common EVC. It favours medium to steep eastern, northern and western upper slopes as well as ridgelines. Due to the exposed aspects, the steepness of slope and shallow soils, the effective rainfall is low at these sites. Forest height varies from 8 to 40 metres, however the most common height range is between 20 to 25 metres. Broad-leaf Peppermint (*E. dives*) and Brittle Gum (*E. mannifera*) dominate the overstorey, while Dwarf Geebung (*Persoonia chameapeuce*), Rough C. (*C. hirtella*), Slender Rice-flower (*Pimele linifolia*) and Common Cassinia (*C. aculeata*) are common in the shrubby understorey.

Wet Forest

Wet Forest is relatively uncommon within the region. It is restricted to protected gullies and southern slopes that tend to have abundant rainfall, deep, rich, well-drained soils and offer some degree of fire protection. Alpine Ash (*E. delegatensis*) and Mountain Gum (*E. dalrympleana*) usually dominate the tall eucalypt overstorey. These forests form the tallest forests in the North East at up to 70 metres. The scattered understorey trees consist of Silver Wattle (*A. dealbata*) and Blackwood (*A. melanoxylon*), while the tall shrublayer is dominated by Hazel Pomaderris (*P. aspera*), Musk Daisy-bush (*Olearia agrophylla*), Austral Mulberry (*Hedycarya angustifolia*) and Blanket Leaf (*Bedfordia arborescens*). Soft Tree fern (*Dicksonia antarctica*) are nearly always found beneath these shrubs. Ferns dominate the ground layer.

Damp Forest

Damp Forest is a widespread but uncommon EVC, occurring on sheltered south-eastern to southern slopes and in gullies from 600 m to 1000 m altitude. Messmate (*E. obliqua*), Narrow-leaf Peppermint (*E. radiata*) and Eurabbie (*E. globulus* spp. *bicostata*) dominate the overstorey. The medium to tall shrub layer consists of Hazel Pomaderris (*P. aspera*), Blackwood (*A. melanoxylon*), Musk Daisy-bush (*O. agrophylla*) and Blanket Leaf (*B. arborescens*). Many ferns and some grasses are present in the ground layer.

Box Ironbark Forest

Within the North East, this EVC occurs in the Chiltern Box Ironbark National Park. Box Ironbark Forests are found on undulating rises and low rolling hills of Ordovician sediments, which are often stony, have low fertility and poor water-holding capacity. Box Ironbark Forests of the North East differ from those of the Goldfields (further west). They support a much denser cover of grass species (commonly 30%) and vary in species composition, such as the replacement of the Goldfields Red Ironbark (*E. tricarpa*) with Mugga/Red Ironbark (*E. sideroxylon*). Species such as Grey Guinea-flower (*H. obtusifolia*) and Dense Spear-grass (*Astrostipa densiflora*) are prominent.

Valley Heathy Forest

Valley Heathy Forest occurs on colluvial sands on outwash slopes and in valleys below low granitic or sedimentary hills. Annual rainfall ranges from 750 mm to 850 mm. The vegetation is predominantly sedgy and grassy with a sparse or clumped stratum of tall shrubs and low ericoid shrubs. Two distinct communities occur in the North East. North of Mount Samaria the dominant overstorey species include Blakely's Red Gum (*E. blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and Long-leaf Box (*E. goniocalyx*). The shrub layer can include Varnish Wattle (*A. verniciflua*), Hedge Wattle (*A. paradoxa*), Prickly Tea-tree (*L. continentale*) and Violet Kunzea (*K. parviflora*). Ground cover can include Common Saw-sedge (*Lepidosperma laterale*), Common Raspwort (*G. tetragynus*) and Brown-black Wallaby Grass (*A. duttoniana*).

North of Cherry Tree Range the overstorey species include Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*), Grey Box (*E. microcarpa*) and Yellow Box (*E. melliodora*). The shrub layer is sparse and includes Black Wattle (*A. mearnsii*) and Grey Guinea Flower (*H. obtusifolia*), while Small Grass-trees (*Xanthorrhoea minor*) and Saw-sedges (*Gahnia* spp.) cover the ground.

Montane Damp Forest

Montane Damp Forest is common and widespread in the southern half of the study area. Occurring at moderate to high elevations, it favours the sheltered southern, south-western and south-eastern slopes. The overstorey is tall ranging from 30–45 metres in height. Alpine Ash (*E. delegatensis*) dominates this stratum, with Mountain Gum (*E. dalrympleana*) and Broad-leaf Peppermint (*E. dives*) occurring in the more exposed sites. At higher altitudes, Montane Damp Forest is often dominated by pure stands of Snow Gum (*E. pauciflora*).

Shrubland and Scrub Vegetation

Perched Boggy Shrubland

Restricted to valleys where the rainfall is between 900 mm and 1150 mm, and soils are extremely saturated sandy clays, this site is often associated with an impermeable clay layer creating a spring or soak effect. A dense shrubland of Prickly Tea-tree (*L. continentale*), Baeckea (*Baeckea* sp.) and Ovens Wattle (*A. pravissima*) occur up to three metres in height. The understorey is dense and includes Sphagnum Moss (*Sphagnum* sp.), Creeping Raspwort (*G. micranthas*), Buttercup (*Ranunculus* sp.), Spiny-headed Mat-rush (*Lomandra longifolia*), Common Woodrush (*L. meridionalis*) and Saw-sedge (*Gahnia* sp.) and Rush (*Juncus* sp.) species. In the North East this EVC was always found to be surrounded by Herb-rich Foothill Forest.

Riparian Shrubland

Riparian Shrubland occurs in streambeds of minor creeks, where periodic disturbance from flooding is high. Infertile course sands and rock bars support this EVC. Shrubs able to withstand frequent flooding dominate the overstorey with

Blackwood (*A. melanoxylon*), Silver Wattle (*A. dealbata*), Ovens Wattle (*A. pravissima*) and Black Wattle (*A. mearnsii*) falling into this category. Other species include Musk Daisy-bush (*O. agrophylla*), Prickly Current-bush (C. *quadrifida*) and Sweet Bursaria (*Bursaria spinosa*).

Riverine Escarpment Scrub

Restricted to foothill and lowland elevations, Riverine Escarpment Scrub occurs on gentle and steep slopes associated with rivers and larger creeks. Candlebark (*E. rubida*) dominates the sparse overstorey. Other eucalypt species dispersed throughout this EVC can include Narrow-leafed Peppermint (*E. radiata* s.1.) and Manna Gum (*E. viminalis*). A thick medium to tall shrublayer often restricts regeneration of the overstorey species. Several Pomaderris species have restricted distribution within Riverine Escarpment Scrub. These include Hazel Pomaderris (*P. aspera*), Prunus Pomaderris (*P. prunifolia*), Blunt-leaf Pomaderris (*P. helianthemifolia*) and Velvet Pomaderris (*P. velutina*). Slender Tea-tree (*L. brevipes*) and Burgan (*K. ericoides*) are also present in the shrublayer.

Mosaics and Complexes

The following descriptions of mosaics and complexes are brief. For a more detailed description of each component, see descriptions of individual ECVs, where listed.

Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic

This EVC represents a mosaic of Riverine vegetation types ranging from open River Red Gum (*E. camaldulensis*) forests with a grassy-sedgy understorey to areas of treeless wetland and floodway vegetation of reedbed or rushland, grassland, sedgeland or herbland structures. This EVC occurs almost entirely along the Murray River where they are subject to frequent flooding. Marginal sites may also contain Grey Box (*E. microcarpa*) and Yellow Box (*E. melliodora*).

Plains Grassy Woodland/Floodland Riparian Woodland Complex

This vegetation complex is mapped where there is insufficient information to accurately map the boundaries between EVCs. The Plains Grassy Woodland/Floodland Riparian Woodland complex occurs at the Grassy Woodland and Floodplain Riparian Woodland interface. This usually occurs along the banks of slow moving rivers and the surrounding floodplains, where seasonal inundation occurs.

Riparian Forest/Swampy Riparian Woodland/Riverine Escarpment Scrub Mosaic (Riparian Mosaic-North East)

This mosaic describes riparian vegetation where the discrete floristic entities were unable to be distinguished in the mapping due to the scale used, or where more than one type of riparian vegetation was assumed to be present. The mosaic can be a result of narrow riparian sites or rapid changes in site characteristics. This mosaic can represent combinations of Riparian Forest, Swampy Riparian Woodland, Riverine Escarpment Scrub and disturbed Riparian Shrubland.

Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic

This EVC represents a mosaic of hillside vegetation associated with rocky outcrops. Here the soil water availability is often low. Structurally it can range from low woodlands to herblands. In the woodlands species include Blakely's Red Gum (*E. blakelyi*), Red Stringybark (*E. macrorhyncha*), Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii*) and Black Cypress Pine (*C. endlicheri*). In the herblands, Common Fringe-myrtle (*Calytrix tetragona*), Shining Cassinia (*C. longifolia*), Nodding Blue-lily (*Stypandra glauca*) and Varnish Wattle (*A. verniciflua*) can be found.

Rocky Outcrop Shrubland/Herbland Mosaic

Rocky Outcrop Shrubland/Herbland Mosaic favours low to moderate elevations where soil moisture availability is low. It occurs in areas such as the Strathbogie Ranges, Mount Pilot, Mount Wombat and Mount Lawson. Low shrubs dominate this EVC, although occasional eucalypts may occur. A dense shrublayer can include Common Fringe-myrtle (*C. tetragona*), Shining Cassinia (*C. longifolia*), Nodding Blue-lily (*S. glauca*) and Varnish Wattle (*A. verniciflua*).

Gilgai Plains Woodland/Wetland /Heathy Dry Forest Mosaic

This EVC occupies old alluvial terraces of silt and clay. The self-mulching clays create Gilgai land formations of humps and hollows. Where Wetland occurs in the hollows, Gilgai Plains Woodland occurs on humps and Heathy Dry Forest occurs on exposed northern and western slopes and ridge tops.

Overstorey vegetation includes River Red Gum (*E. camaldulensis*) and a low canopy of Red Stringybark (*E. macrorhyncha*) and Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii*). Broad-leaf Peppermint (*E. dives*) and Red Box (*E. polyanthemos*) may be present. Understorey is predominantly Hedge Wattle (*A paradoxa*). Low growing ericoid and small-leafed shrubs dominate the shrublayer and include Daphne Heath (*B. daphnoides*), Small-leafed Parrot-pea (*D. phylicoides*) and Silky Guinea-flower (*H. sericea*). The ground layer contains the greatest diversity, with forbs being dominant.

Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex

Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex is generally found on lower slopes, drainage lines and old alluvial plains of undulating landscapes and small linear areas where the rainfall is between 500 mm and 600 mm. Overstorey vegetation consists of Grey Box (*E. microcarpa*), White Box (*E. albens*) and Yellow Box (*E. melliodora*) west of the study area, and River Red Gum (*E. camaldulensis*) further east. A very sparse shrublayer, consisting of wattle species occurs above a highly diverse ground layer. Many grass, sedge and lily species including Kangaroo Grass (*T. triandra*), Wallaby Grasses (*Austrodanthonia* spp.) and Tall Sedge (*C. appressa)* are found. The ground layer is dominated by herbs, forbs and grasses including Grassland Wood-sorrel (*O. perennans*), Stinking Penny-wort (*H. laxiflora*), Sheep's Spurr (*A. achinata*) and Chocolate Lily (*A. stictum*).

Grassy Dry Forest/Rocky Outcrop Shrubland/Herbland Mosaic

This EVC represents a mosaic of lower slope and hillside vegetation often associated with rocky outcrops. Structurally it can range from Grassy Dry Forest to Herbland. Overstorey species can include, Red Stringybark (*E. macrorhyncha*), Long-leaf Box/Silver Bundy (*E. goniocalyx/nortonii* and Broad-leaf Peppermint (*E. dives*) and stand between 15 to 20 metres high. The diversity of the shrub stratum is characteristically low and may include Silver Wattle (*A. dealbata*), Honey Pots (*A. serrulata*), Common Hovea (*H. linearis*) and Grey Guinea-flower (*H. obtusifolia*). In the herblands Common Fringe-myrtle (*C. tetragona*), Shining Cassinia (*C. longifolia*), Nodding Blue-lily (*S. glauca*) and Varnish Wattle (*A. verniciflua*) are often present.

Riparian Forest/Swampy Riparian Woodland Mosaic

The Riparian Forest/Swampy Riparian Woodland Mosaic occurs on low slopes, alluvial terraces, riverbanks and streams or drainage lines. Dominant overstorey species include Manna Gum (*E. viminalis*) and Mountain Swamp Gum (*E. camphora*) with other eucalypts such as Narrow-leaf Peppermint (*E. radiata*) and Eurabbie (*E. globulus*. spp. *bicostata*) also present. Shrubs include Silver Wattle (*A. dealbata*), Hazel Pomaderris (*P. aspera*), Tree Lomatia (L. fraseri), Prickly Current-bush (*C. quadrifida*), Blackwood (A. *melanoxylon*) and Common Cassinia (C. *aculeata*).

Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic

Floodplain Riparian Woodland / Plains Grassy Woodland Mosaic are located along banks of larger slower moving rivers or small linear areas where the rainfall is between 500 mm and 600 mm. The sparse overstorey consists of Grey Box (*E. microcarpa*), White Box (*E. albens*) and Yellow Box (*E. melliodora*) in the west of the study area, and River Red Gum (*E. camaldulensis*) further east. A very sparse shrublayer, consisting of wattle species occurs above a highly diverse ground layer of grass, sedge and lily species including Kangaroo Grass (*T. triandra*), Wallaby Grasses (*Austrodanthonia* spp.) and Tall Sedge (*C. appressa*).

Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic

This mosaic occurs on north to north-western aspects on the edges of granite hills, or it may occur on all aspects where rainfall is low. This EVC is restricted to freely draining, deep sandy clay colluviums on gentle, lower slopes of 650 m altitude or less. Overstorey species comprise Blakely's Red Gum (*E. blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. ployanthemos*) and Yellow Box (*E. melliodora*). A dense low shrub layer includes a diversity of Guinea Flowers (*Hibbertia spp*.). The ground layer has a high proportion of both native and introduced grasses and forbes. Weeping grass (*Microlaena stipoids*), Common Plume Grass (*Dichelachne rara*) and Common Wheat Grass (*Elymus scabrus)* are often found.

Treeless Sub-alpine Mosaic

Occurring on the highest peaks and plateaux of the region, Treeless Sub-alpine Mosaic is restricted to sub-alpine elevations where cold air drainage sites occur between 1400 m and 1986 m. It occurs at sites that are too severe for Snow Gum (*E. pauciflora*). Some of the EVCs found in this mosaic include Sub-alpine Damp Heathland, Sub-alpine Dry Heathland, Sub-alpine Grassland, Snowpatch Herbland and Blockstream Coniferous Heathland.

APPENDIX F

DISTRIBUTION OF OLD-GROWTH FOREST IN CONSERVATION RESERVES AND FOREST MANAGEMENT ZONES WITHIN THE NORTH EAST

Ecological Vegetation Class (EVC)	Area of old-growth (ha)	Conservation Reserves		State forest			
				Special Protection Zone		*Code* prescriptions[1]	
		Area (ha)	%	Area (ha)	%	Area (ha)	%
18. Riparian Forest	523	157	30	336	64	0	0
20. Heathy Dry Forest	22 113	10 183	46	4 466	20	1 739	8
21. Shrubby Dry Forest	93 800	31 307	33	17 958	19	10 692	11
22. Grassy Dry Forest	16 752	4 426	26	6 096	36	1 083	6
23. Herb-rich Foothill Forest	60 253	16 827	28	13 380	22	8 175	14
29. Damp Forest	6 316	1 748	28	1 327	21	1 210	19
30. Wet Forest	1 457	709	49	265	18	232	16
36. Montane Dry Woodland	31 785	14 943	47	3 381	11	4 179	13
38. Montane Damp Forest	6 788	2 589	38	777	11	1 226	18
41. Montane Riparian Thicket	117	35	30	76	65	0	0
43. Sub-alpine Woodland	14 872	12 434	84	223	2	231	2
47. Valley Grassy Forest	16	10	64	4	24	0	0
72. Granitic Hills Woodland	4 259	4 221	99	33	1	3	<1
83. Swampy Riparian Woodland	253	99	39	126	50	0	0
84. Riparian Mosaic – North East	158	55	35	104	65	0	0
Total	**259 462**	**99 743**	**38**	**48 552**	**19**	**28 770**	**11**

Notes:

1. Areas protected from timber harvesting by application of a limit on harvesting on slopes in excess of 30 degrees and within 20 metres of permanent streams as required by the *Code of Forest Practices for Timber Production.*

APPENDIX G

PUBLIC LAND CATEGORIES THAT CONTRIBUTE TO THE CAR RESERVE SYSTEM

Land Category
National Parks[1]
Alpine National Park
Mount Buffalo National Park
Burrowa-Pine Mountain National Park
Chiltern Box Ironbark National Park
Lake Eildon National Park
State Parks1
Mount Samaria State Park
Mount Granya State Park
Mount Lawson State Park
Regional Park
Reef Hills Regional Park
Beechworth Regional Park
Baranduda Range Regional Park
Wodonga Regional Park[2]
Jarvis Creek Plateau Regional Park
Mount Mitta Mitta Regional Park[3]
Multi-purpose Parks
Mount Pilot Multi-purpose Park
Wilderness Park
Wabba Wilderness Park
Reference Areas
Ryan Creek Reference Area
Pilot Range Reference Area
Lightwood Reference Area
TooRour Reference Area
Glen Creek Reference Area
Mitta Mitta Reference Area
Dry Forest Creek Reference Area
Lucyvale Creek Reference Area
Cudgewa Creek Reference Area
Burbibyong Creek Reference Area
Cambatong Reference Area
King Reference Area
Drum Top Reference Area
Mount Pleasant Reference Area
Natural Features and Scenic Reserve
Mt Skene
Mt Sarah
Mount Cravensville
Wild Boar Range
Mt Gibbo
Education Area
Lima South Education Area
Mount Barambogie Education Area
Lockhart Creek Education Area
Mountain Creek Education Area
Little Snowy Creek Education Area
Delatite Education Area
Mt Russell Education Area
Sunnyside Education Area
Carboor Upper Education Area
Wandiligong Education Area
Remote and Natural Area
Dandongadale
Yarrabulla

Land Category
Victorian Heritage River Areas
Goulburn Heritage River
Howqua Heritage River
Streamside Reserve
Murray River Reserve
Various
Essentially Natural Catchment Areas
Mount Tabor Creek
Banimboola Creek
Devils Creek – Middle Branch
Yarrabulla Creek
Long Jack Creek
Wongungarra River headwaters
Williams Creek
Upper Big River
Snowy Creek
Flora Reserve
Tenneriffe Flora Reserve
Big Hill Flora Reserve
Wallaby Gully Flora Reserve
Ruffy Flora Reserve
Balmattum Flora Reserve
Wises Creek Flora Reserve
Pheasant Creek Flora Reserve
Mount Mitta Mitta Flora Reserve[3]
Flora and Fauna Reserve
Mount Wombat–Garden Range Flora and Fauna Reserve
Hat Hill Flora and Fauna Reserve
Wildlife Reserve
Seven Creeks Wildlife Reserve
Clarke Lagoon Wildlife Reserve
Jeremal Wildlife Reserve
Tintaldra Wildlife Reserve
Ryans Swamp Wildlife Reserve
Black Swamp (Black Dog Creek) Wildlife Reserve
Nature Conservation Reserves
Gobur Nature Conservation Reserve
Yarck Nature Conservation Reserve
Switzerland Range Nature Conservation Reserve
Caveat Nature Conservation Reserve
Homewood Nature Conservation Reserve
Molesworth Nature Conservation Reserve
Jamieson River–Deep Creek Nature Conservation Reserve
Historic Areas
Toombullup Historic Area
Tallangallook–Dry Creek Historic Areas
Nine Mile Creek Historic Area
Bethanga Historic Area
Howqua Hills Historic Area
Scenic Reserve
Barnawartha
Murmungee
Bishops Mitre Rock
Powers Lookout
Mt Porepunkah
Tawonga Gap

Notes:

1. National Parks and State Parks may also contain Reference Areas, Remote and Natural Areas, Wilderness Zones, Heritage River Areas and Natural Catchment Areas which are not specified in this table.
2. Excluding areas formerly vested in Albury–Wodonga (Victoria) Corporation.
3. Also known as Mt Mittamatite.

APPENDIX H

REPRESENTATIVE CONSERVATION OF ECOLOGICAL VEGETATION CLASSES

Ecological Vegetation Class	Area (ha)		% Area Remaining		Conservation Reserves (ha)	State forest (ha)		% EVC Protected Public Land[1]	
	Pre-1750	Current (all land tenures)	All land	Public land		SPZ	*Code*	Pre-1750[2]	Current[3]
7. Clay Heathland	64	34	53	29	16	3	-	29	100
18. Riparian Forest	16 079	11 272	70	63	3 287	6 536	-	61	97
19. Riparian Shrubland	1 442	908	63	57	815	-	-	57	100
20. Heathy Dry Forest	99 282	83 089	84	73	29 651	11 766	4 869	42	57
21. Shrubby Dry Forest	291 096	276 822	95	92	85 409	42 236	28 730	44	48
22. Grassy Dry Forest	296 418	146 344	49	30	22 779	20 766	4 121	15	49
23. Herb-rich Foothill Forest	555 494	402 583	72	62	97 518	54 448	42 433	27	44
29. Damp Forest	48 308	46 686	97	96	12 783	7 926	9 246	43	45
30. Wet Forest	6 686	6 253	94	94	2 826	1 127	1 018	59	63
36. Montane Dry Woodland	138 148	136 331	99	99	59 652	9 907	14 307	50	51
38. Montane Damp Forest	40 359	38 328	95	95	14 544	3 167	5 680	44	46
41. Montane Riparian Thicket	1 199	1 089	91	91	267	772	-	87	95
43. Sub-alpine Woodland	35 484	35 342	100	100	28 045	607	562	81	81
44. Treeless Sub-alpine Complex	21 017	20 491	97	97	18 839	9	-	90	92
47. Valley Grassy Forest	250 255	18 787	8	2	1 985	2 240	-	2	77
48. Heathy Woodland	37	37	100	100	-	37	-	100	100
55. Plains Grassy Woodland	210 803	1 925	1	0	47	10	-	<1	73
56. Floodplain Riparian Woodland	46 747	4 306	9	3	889	6	-	2	68
59. Riparian Thicket	502	118	24	-	-	-	-	-	
61. Box Ironbark Forest	20 311	3 804	19	15	3 044	-	-	15	98

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REPRESENTATIVE CONSERVATION OF ECOLOGICAL VEGETATION CLASSES *(continued)*

Ecological Vegetation Class	Area (ha)		% Area Remaining		Conservation Reserves (ha)	State forest (ha)		% EVC Protected Public Land[1]	
	Pre-1750	Current (all land tenures)	All land	Public land		SPZ	*Code*	Pre-1750[2]	Current[3]
67. Alluvial Terraces Herb-rich Woodland	209	12	6	4	8			4	100
68. Creekline Grassy Woodland	9 976	441	4	0	28	4		<1	87
72. Granitic Hills Woodland	31 080	21 149	68	52	15 553	194	13	51	97
73. Rocky Outcrop Shrubland/Herbland	3 480	3 232	93	87	2 344	524		82	95
74. Wetland Formation	3 672	249	7						
79. Gilgai Plain Woodland/Wetland/Heathy Dry Forest Mosaic	757	528	70	67	506			67	100
80. Spring Soak Herbland	55	13	24	1					
81. Alluvial Terraces Herb-rich Woodland/Creekline Grassy Woodland Mosaic	344	35	10						
82. Riverine Escarpment Scrub	677	516	76	65	151	264		61	94
83. Swampy Riparian Woodland	5 213	2 005	38	29	439	936		26	91
84. Riparian Mosaic - North East	6 730	2 597	39	34	407	1 629		30	88
127. Valley Heathy Forest	1 747	95	5	1	13			1	100
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex	1 092	18	2	2	17			2	100
153. Montane Damp Forest/Montane Wet Forest Mosaic	916	21	2	0	1			<1	100
174. Grassy Dry Forest/Rocky Outcrop Shrubland/Herbland Mosaic	954	189	20	4					
175. Grassy Woodland	86 742	4 472	5	1	144	466		1	78
185. Perched Boggy Shrubland	1 725	296	17	1		16		1	100
186. Plains Grassy Woodland/Floodplain Riparian Woodland Complex	7 880	273	3	<1		3		<1	53
187. Plains Grassy Woodland/Rainshadow Grassy Woodland Complex	2 730	22	1						
188. Plains Grassy Woodland/Valley Grassy Forest Complex	1 936	21	1	2	21			1	50
190. Plains Grassy Woodland/Valley Grassy Forest/Rainshadow Grassy Woodland Complex	2 397	109	5						
213. Valley Grassy Forest/Box Ironbark Forest Complex	1 638	131	8						

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REPRESENTATIVE CONSERVATION OF ECOLOGICAL VEGETATION CLASSES *(continued)*

Ecological Vegetation Class	Area (ha)		% Area Remaining		Conservation Reserves (ha)	State forest (ha)		% EVC Protected Public Land[1]	
	Pre-1750	Current (all land tenures)	All land	Public land		SPZ	*Code*	Pre-1750[2]	Current[3]
235. Gilgai Plain Woodland/Wetland Mosaic	9 899	483	5	3	280			3	100
237. Riparian Forest/Swampy Riparian Woodland Mosaic	4 644	390	8	1	8	34		1	90
238. Plains Grassy Woodland/Creekline Grassy Woodland/Floodplain Riparian Woodland	3 880	53	1						
240. Plains Grassy Woodland/Creekline Grassy Woodland/Wetland Mosaic	8 308	347	4						
241. Valley Grassy Forest/Plains Grassy Woodland Mosaic	577	2	<1						
243. Grassy Dry Forest/Shrubby Granitic-outwash Grassy Woodland	187	2	1						
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic	3 984	3 017	76	63	2 338	120		62	98
245. Granitic Hills Woodland/Heathy Dry Forest Mosaic	12								
247. Box Ironbark Forest/Spring Soak Herbland Mosaic	212	7	3						
248. Grassy Dry Forest/Spring Soak Herbland Mosaic	392	64	16						
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic	3 098	74	2	<1	4			<1	100
251. Rainshadow Grassy Woodland/Valley Grassy Forest Mosaic	3 623	52	1						
254. Shrubby Granite-outwash Grassy Woodland/Valley Grassy Forest Mosaic	175	18	10	6					
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic	26 789	3 950	15	2	198	265		2	93
264. Sand Ridge Woodland	25	2	7						
265. Valley Grassy Forest/Grassy Dry Forest Mosaic	254	100	39						

Notes:

1. Total area protected represents the sum of conservation reserves and State forest SPZ. Areas protected by the *Code of Forest Practices for Timber Production* (NRE 1996a) prescriptions afford additional protection but are not included in this calculation.
2. The protected public land area of each EVC expressed as a percentage of the estimated pre-1750 extent of the EVC.
3. The protected public land area of each EVC expressed as a percentage of the current extent of the EVC on public land.

APPENDIX I

REPRESENTATIVE CONSERVATION OF ECOLOGICAL VEGETATION CLASSES IN GEOGRAPHIC REPRESENTATION UNITS *(Part 1 of 6)*

Ecological Vegetation Classes	Barry Mountains		Big Ben Foothills		Big River Mountains		Bogong Mountains	
	Protected		Protected		Protected		Protected	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
7. Clay Heathland								
18. Riparian Forest	1 702	100			2 290	95	927	93
19. Riparian Shrubland								
20. Heathy Dry Forest	4 880	66	505	17	784	25	507	42
21. Shrubby Dry Forest	13 429	68	4 000	23	8 039	46	3 920	47
22. Grassy Dry Forest			14 523	47	774	30	191	32
23. Herb-rich Foothill Forest	18 454	66	7 941	29	9 090	37	5 192	47
29. Damp Forest	2 205	64	293	35	2 712	39	1 964	68
30. Wet Forest	1 047	76	12	30	450	57	1 064	87
36. Montane Dry Woodland	15 704	67	960	55	7 391	49	16 808	84
38. Montane Damp Forest	2 639	61	51	30	2 509	45	5 712	80
41. Montane Riparian Thicket	70	91			29	100	127	100
43. Sub-alpine Woodland	2 624	98			3 107	72	15 111	91
44. Treeless Sub-alpine Mosaic	299	100			499	78	16 633	92
47. Valley Grassy Forest			266	16	19	4	18	25
48. Heathy Woodland					37	100		
55. Plains Grassy Woodland			1	1				
56. Floodplain Riparian Woodland								
61. Box Ironbark Forest								
67. Alluvial Terraces Herb-rich Woodland								
68. Creekline Grassy Woodland			3	8				
72. Granitic Hills Woodland								
73. Rocky Outcrop Shrubland/ Herbland Mosaic	149	100	169	93			17	100
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic								
80. Spring Soak Herbland								
82. Riverine Escarpment Scrub								
83. Swampy Riparian Woodland	376	94	2	15	25	100	179	93
84. Riparian Mosaic – North East	45	28	16	55	84	100		
127. Valley Heathy Forest								
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex								
153. Montane Damp Forest/Montane Wet Forest Mosaic								
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic								
175. Grassy Woodland					59	50		
185. Perched Boggy Shrubland								
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex								
237. Riparian Forest/Swampy Riparian Woodland Mosaic			6	5			9	24
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic								
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic								
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic								
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic								

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Representative Conservation of Ecological Vegetation Classes in Geographic Representation Units - Part 2 of 6

Ecological Vegetation Classes	Buffalo Mountains		Corryong Foothills		Dartmouth Mountains		Delatite Valley	
	Protected		Protected		Protected		Protected	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
7. Clay Heathland								
18. Riparian Forest	118	47	19	100	458	96	324	81
19. Riparian Shrubland	548	97						
20. Heathy Dry Forest	3 126	32	3 788	79	3 945	97	428	37
21. Shrubby Dry Forest	22 544	56	1 703	69	18 127	61	1 414	19
22. Grassy Dry Forest	1 863	25	2 649	24	885	48	5 113	54
23. Herb-rich Foothill Forest	17 874	48	3 612	59	15 007	59	2 816	19
29. Damp Forest	991	56			2 412	38	750	36
30. Wet Forest	45	100			74	28	18	26
36. Montane Dry Woodland	8 818	69	1 908	99	5 651	37	730	20
38. Montane Damp Forest	2490	76	42	100	1 356	21	78	11
41. Montane Riparian Thicket					14	100	26	43
43. Sub-alpine Woodland	4 027	94			936	81	131	11
44. Treeless Sub-alpine Mosaic	903	100			383	100		
47. Valley Grassy Forest	23	19	1 001	35	368	90	48	7
48. Heathy Woodland								
55. Plains Grassy Woodland			5	27				
56. Floodplain Riparian Woodland	6	2	3	2				
61. Box Ironbark Forest								
67. Alluvial Terraces Herb-rich Woodland								
68. Creekline Grassy Woodland								
72. Granitic Hills Woodland			7 456	77				
73. Rocky Outcrop Shrubland/ Herbland Mosaic	613	100	734	100				
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic								
80. Spring Soak Herbland								
82. Riverine Escarpment Scrub	71	100			1	100		
83. Swampy Riparian Woodland	11	68	10	100	14	100		
84. Riparian Mosaic – North East	223	63			135	99		
127. Valley Heathy Forest								
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex								
153. Montane Damp Forest/Montane Wet Forest Mosaic								
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic								
175. Grassy Woodland			95	28			34	32
185. Perched Boggy Shrubland								
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex								
237. Riparian Forest/Swampy Riparian Woodland Mosaic	12	15	4	41				
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic								
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic			4	6				
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic								
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic								

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Representative Conservation of Ecological Vegetation Classes in Geographic Representation Units - Part 3 of 6

Ecological Vegetation Classes	Granya Foothills		Highlands Foothills		King River Floodplains		Matlock Mountains	
	Protected		Protected		Protected		Protected	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
7. Clay Heathland	16	100						
18. Riparian Forest			178	35			193	98
19. Riparian Shrubland			130	82				
20. Heathy Dry Forest	4 290	67	24	9	1 314	43	506	41
21. Shrubby Dry Forest	5 581	84			0	0	970	26
22. Grassy Dry Forest	2 834	42	956	14	3 968	35	44	28
23. Herb-rich Foothill Forest	3 766	52	1 579	12	464	16	1 040	27
29. Damp Forest			96	58	17	100	890	24
30. Wet Forest								
36. Montane Dry Woodland					7	76	661	19
38. Montane Damp Forest							126	9
41. Montane Riparian Thicket								
43. Sub-alpine Woodland							645	94
44. Treeless Sub-alpine Mosaic							54	100
47. Valley Grassy Forest	532	55	11	1	538	46		
48. Heathy Woodland								
55. Plains Grassy Woodland			3	1				
56. Floodplain Riparian Woodland			883	46	0	0		
61. Box Ironbark Forest								
67. Alluvial Terraces Herb-rich Woodland								
68. Creekline Grassy Woodland	4	44			0	1		
72. Granitic Hills Woodland	5 971	94	298	30				
73. Rocky Outcrop Shrubland/ Herbland Mosaic	161	100	131	59				
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic								
80. Spring Soak Herbland								
82. Riverine Escarpment Scrub			1	8				
83. Swampy Riparian Woodland	61	49	26	15			34	100
84. Riparian Mosaic – North East			0	0	25	64		
127. Valley Heathy Forest								
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex								
153. Montane Damp Forest/Montane Wet Forest Mosaic								
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic								
175. Grassy Woodland	27	5	1	0				
185. Perched Boggy Shrubland								
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex								
237. Riparian Forest/Swampy Riparian Woodland Mosaic								
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic								
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic								
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic								
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic								

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Representative Conservation of Ecological Vegetation Classes in Geographic Representation Units - Part 4 of 6

Ecological Vegetation Classes	Mitta Foothills		Mt Pilot Foothills		Pinnibar Mountains		Strathbogie Foothills	
	Protected		Protected		Protected		Protected	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
7. Clay Heathland								
18. Riparian Forest	300	92			1 034	90	176	59
19. Riparian Shrubland			137	76				
20. Heathy Dry Forest	133	6	3 497	64	1 475	62	1 698	45
21. Shrubby Dry Forest	8 759	29			17 743	53	360	76
22. Grassy Dry Forest	1 554	14	2 765	28	458	9	819	9
23. Herb-rich Foothill Forest	10 798	29	34	12	20 585	49	3 818	16
29. Damp Forest	1 076	29			3 572	62	384	32
30. Wet Forest					1 189	52		
36. Montane Dry Woodland	331	12			7 808	36		
38. Montane Damp Forest	75	7			2 138	39		
41. Montane Riparian Thicket					242	100		
43. Sub-alpine Woodland					2 335	68		
44. Treeless Sub-alpine Mosaic					40	100		
47. Valley Grassy Forest	171	49	777	18	11	4	301	15
48. Heathy Woodland								
55. Plains Grassy Woodland	17	24	32	5				
56. Floodplain Riparian Woodland	2	1			0	1		
61. Box Ironbark Forest			2 424	89			619	89
67. Alluvial Terraces Herb-rich Woodland			8	68				
68. Creekline Grassy Woodland			21	11				
72. Granitic Hills Woodland			2 019	55			4	25
73. Rocky Outcrop Shrubland/ Herbland Mosaic			339	71	32	100	155	78
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic							506	96
80. Spring Soak Herbland			0	2				
82. Riverine Escarpment Scrub	7	27			106	85		
83. Swampy Riparian Woodland	80	82	22	15	204	80	43	43
84. Riparian Mosaic – North East	378	96			341	87	44	97
127. Valley Heathy Forest								
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex			17	94				
153. Montane Damp Forest/Montane Wet Forest Mosaic			1	7				
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic								
175. Grassy Woodland	16	19	333	19			45	6
185. Perched Boggy Shrubland							16	7
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex	3	1						
237. Riparian Forest/Swampy Riparian Woodland Mosaic								
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic			2 458	87				
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic								
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic								
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic	7	2	456	29				

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Representative Conservation of Ecological Vegetation Classes in Geographic Representation Units - Part 5 of 6

Ecological Vegetation Classes	Tallangatta Foothills		Toombullup Foothills		Upper King Mountains	
	Protected		Protected		Protected	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
7. Clay Heathland					3	25
18. Riparian Forest	286	94	599	86	1 347	89
19. Riparian Shrubland						
20. Heathy Dry Forest	787	19	3 229	34	6 501	63
21. Shrubby Dry Forest	6 260	25	253	13	15 714	49
22. Grassy Dry Forest	424	5	3 208	27	516	17
23. Herb-rich Foothill Forest	7 370	23	5 925	26	18 063	43
29. Damp Forest	1 616	44	452	29	1 480	63
30. Wet Forest					113	81
36. Montane Dry Woodland	1 618	32			3 254	37
38. Montane Damp Forest	529	32			320	24
41. Montane Riparian Thicket	346	100	175	99	17	100
43. Sub-alpine Woodland	107	100			102	13
44. Treeless Sub-alpine Mosaic					37	90
47. Valley Grassy Forest	42	19	52	4	64	65
48. Heathy Woodland						
55. Plains Grassy Woodland					1	2
56. Floodplain Riparian Woodland						
61. Box Ironbark Forest						
67. Alluvial Terraces Herb-rich Woodland						
68. Creekline Grassy Woodland			3	11		
72. Granitic Hills Woodland						
73. Rocky Outcrop Shrubland/ Herbland Mosaic			54	100	313	80
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic						
80. Spring Soak Herbland						
82. Riverine Escarpment Scrub	100	69			130	100
83. Swampy Riparian Woodland	75	58	62	57	152	91
84. Riparian Mosaic – North East	349	87	143	89	255	81
127. Valley Heathy Forest					13	49
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex						
153. Montane Damp Forest/Montane Wet Forest Mosaic						
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic						
175. Grassy Woodland						
185. Perched Boggy Shrubland						
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex						
237. Riparian Forest/Swampy Riparian Woodland Mosaic					13	18
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic						
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic						
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic						
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic						

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Representative Conservation of Ecological Vegetation Classes in Geographic Representation Units - Part 6 of 6

Ecological Vegetation Classes	Total		
	Public land	Protected	
	(ha)	(ha)	%
7. Clay Heathland	19	19	100
18. Riparian Forest	10 161	9 952	98
19. Riparian Shrubland	815	815	100
20. Heathy Dry Forest	72 155	41 471	57
21. Shrubby Dry Forest	266 546	129 166	48
22. Grassy Dry Forest	88 155	43 813	50
23. Herb-rich Foothill Forest	344 337	153 939	45
29. Damp Forest	46 288	21 318	46
30. Wet Forest	6 253	4 005	64
36. Montane Dry Woodland	136 331	71 948	53
38. Montane Damp Forest	38 328	18 271	48
41. Montane Riparian Thicket	1 089	1 046	96
43. Sub-alpine Woodland	35 342	29 160	83
44. Treeless Sub-alpine Mosaic	20 491	18 848	92
47. Valley Grassy Forest	5 515	4 243	77
48. Heathy Woodland	37	37	100
55. Plains Grassy Woodland	79	57	73
56. Floodplain Riparian Woodland	1 317	895	68
61. Box Ironbark Forest	3 111	3 044	98
67. Alluvial Terraces Herb-rich Woodland	8	8	100
68. Creekline Grassy Woodland	37	32	87
72. Granitic Hills Woodland	16 194	15 748	97
73. Rocky Outcrop Shrubland/ Herbland Mosaic	3 032	2 868	95
79. Gilgai Plain Woodland/Wetland/ Heathy Dry Forest Mosaic	506	506	100
80. Spring Soak Herbland	1		
82. Riverine Escarpment Scrub	443	415	94
83. Swampy Riparian Woodland	1 511	1 375	91
84. Riparian Mosaic – North East	2 302	2 044	89
127. Valley Heathy Forest	13	13	100
152. Alluvial Terraces Herb-rich Woodland/Plains Grassy Woodland Complex	17	17	100
153. Montane Damp Forest/Montane Wet Forest Mosaic	1	1	100
174. Grassy Dry Forest/Rocky Outcrop Shrubland/ Herbland Mosaic	39		
175. Grassy Woodland	786	610	78
185. Perched Boggy Shrubland	16	16	100
186. Plains Grassy Woodland/ Floodplain Riparian Woodland Complex	6	3	53
237. Riparian Forest/Swampy Riparian Woodland Mosaic	47	44	93
244. Granitic Hills Woodland/Rocky Outcrop Shrubland/Herbland Mosaic	2 512	2 458	98
250. Floodplain Riparian Woodland/Plains Grassy Woodland Mosaic	4	4	100
254. Shrubby Granitic-outwash Grassy Woodland/Valley Grassy Forest Mosaic	11		
255. Riverine Grassy Woodland/Riverine Sedgy Forest Mosaic	498	463	93

Note: The Protected Area comprises only those areas found within Dedicated Reserves and Special Protection Zones. The Protected % represents the Protected Area as a proportion of the total EVC found within the GRU. Additional protection is afforded by areas excluded for timber harvesting under the *Code of Forest Practices for Timber Production.*

APPENDIX J

MANAGEMENT OF VALUES FOUND IN SITES OF SIGNIFICANCE IN STATE FOREST WITHIN THE NORTH EAST

This appendix lists the values described in Ecological Survey reports (CFL 1987a); (CFL 1987b); (CFL 1988); (DCE 1992) and indicates the management of these sites. For more detail of each value listed below, refer to the Management Guidelines and Prescriptions in Chapter 3 – *Biodiversity Conservation*.

MANAGEMENT OF SITES OF ZOOLOGICAL SIGNIFICANCE IN STATE FOREST

Site No	Site Names	Zoological Values	Management of values found within each site
Site 1a	Upper Reaches of Saltpetre Creek	Contains many significant bird species, including, Powerful Owl, Yellow-tailed Black Cockatoo, Wonga Pigeon, Scarlet Robin, Spotted Quail-thrush, Gang-gang Cockatoo, Pink Robin. A population of Yellow-bellied Gliders was also present.	Entire site is protected in SPZ
Site 3a	Sassafras Creek	Two significant bird species were present at this site, Yellow-tailed Black Cockatoo and Gang-gang Cockatoo. Large numbers of honeyeaters were present. Yellow-bellied Glider was also present at this site.	Entire site is protected in SPZ
Site 4a	Lower reaches of Sassafras Creek	Significant habitat for many bird species including, Chestnut-rumped Hylacola, Peregrine Falcon, Australian Hobby and Gang-gang Cockatoo.	Entire site is protected in SPZ
Site 5a	Straight Running Creek Track Ridgeline	The rare Sooty Owl has been recorded at this site. This site also includes populations of Greater Gliders, Yellow-tailed Black Cockatoos and Yellow-bellied Gliders. A recently used Wedge-tailed Eagle nest was located.	Entire site is protected in SPZ
Site 6a, 7a and 8a	Riparian Zones along sections of Sassafras, Saltpetre and Straight Running Creeks	Macquarie Perch have been recorded in Gibb River, just south of its confluence with Straight Running Creek. Suitable habitat for breeding sites and spawning sites occur in these creeks. Platypus are also present.	All three sites are protected in SPZ
Site 1b	Wongungarra River	This linear streamside reserve supports a population of Spotted Tree Frogs. Other significant fauna occurring at this site include the Platypus, Eastern Water Dragon, Common Water Skink, the rare Grey Goshawk and Long-nosed Bandicoot.	Part of this site is protected in SPZ, part is in Alpine National Park
Site 2b and 3b	Mount Murray Area	Pink Robin has been recorded in both these sites.	Entire site is in Alpine National Park

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Site No	Site Names	Zoological Values	Management of values found within each site
Site 4b	Mt Murray Track	White's Skink was recorded at this site.	Entire site is in Alpine National Park
Site 5b	The Twins	Species of significance included the rare Broad-toothed Rat and the Peregrine Falcon. This site also has suitable habitat for the vulnerable Alpine She-oak Skink.	Entire site is protected in SPZ
Site 1c	Razorback Spur	This site contains representative sclerophyll Woodland birds.	Entire site is protected in SPZ
Site 2c	Upper reaches of Pegleg Creek	This site habitat for three significant bird species; the rare Sooty Owl, Cicadabird and Australian King Parrot.	Entire site is protected in SPZ
Site 4d	Pretty Valley Creek and Tawonga Hut Creek	This site contains the vulnerable Alpine Water Skink and Mountain Pygmy Possum.	Entire site is in Bogong Unit of Alpine National Park
Site 7d	Clover Forest Block north	Relatively high diversity of arboreal mammals including; Greater Glider, Feather-tailed Glider and Yellow-bellied Glider. A high population density of bats and a rich bird population occurs with two significant bird species; Australian Owlet-nightjar and Black-faced Monarch.	Entire site in Bogong Unit of Alpine National Park
Site 8d	Timms Spur	This site has one of the largest known populations of the vulnerable Mountain Pygmy-possum in Victoria.	Entire site in Bogong Unit of Alpine National Park

MANAGEMENT OF SITES OF BOTANICAL SIGNIFICANCE IN STATE FOREST

Site No	Site Names	Botanical Values	Management of values found within each site
Site 1a	Upper Reaches of Saltpetre Creek	Weed free examples of Montane Riparian Forest. Four significant plant species occurred at this site, Grey Beard-heath (*Leucopogon attenuatus*), Thyme Guinea-flower (*Hibbertia serpyllifolia*), Oval Woodrush (*Luzula ovata*) and Sweet Forget-me-not (*Myosotis suaveolens*).	Entire site is protected in SPZ
Site 2a	Wild Boar Range	Comprises the Natural Features Scenic Reserve D22 (LCC, 1983). One significant species occurred within this site, including Oval Woodrush (*Luzula ovata*).	Entire site is protected in Wild Boar Range Natural Feature and Scenic Reserve
Site 3a	Upper reaches of Sassafras Creek	Contains representative examples of Montane Forest. Two rare or threatened species occur at this site, Catkin Wattle (*Acacia dallachiana*) and Tailed Eyebright (*Euphrasia caudata*). Other significant species include Oval Woodrush (*Luzula ovata*) and Bogong Gum (*E. chapmaniana*).	Entire site is protected in SPZ
Site 4a	Lower reaches of Sassafras Creek	Contains representative stands of Montane Dry Woodland, Montane Forest and Montane Riparian Forest. Three significant plant species are present Bogong Gum (*Eucalyptus chapmaniana*), Feathery Wheat-grass (*Australopyrum pectinatum*) and Woodrush (*Luzula ovata*).	Entire site is protected in SPZ
Site 5a	Straight Running Creek Track Ridgeline	Contains representative samples of Montane Dry Woodland and Montane Riparian Forest. These supported the only recorded locality of Mountain Beauty (*Hovea pannosa*) in the study area. Sweet Forget-me-not (*Myosotis sauveolens*) also occurs in this site.	Entire site is protected in SPZ
Site 1b	Wongungarra River	This site contains representative examples of Riparian Forest and Montane Riparian Forest.	Part of this site is protected in SPZ, part is in Alpine National Park.
Site 2b and 3b	Mount Murray Area	This site contains representative examples of Montane Riparian Forest.	Both sites are protected in Alpine National Park
Site 4b	Mt Murray Track	Representative examples of Snow Gum Woodland occur at this site.	Entire site is in Alpine National Park
Site 5b	The Twins	Snow Gum Woodland and Alpine Heathland are represented at this site.	Entire site is in Alpine National Park
Site 1c	Razorback Spur	Montane Sclerophyll Woodland and Montane Forest dominated this site. Significant stands of Bogong Gum (*Eucalyptus chapmaniana*) present.	Entire site is protected in SPZ
Site 2c	Upper reaches of Pegleg Creek	Montane Sclerophyll Woodland, Montane Forest and Montane Riparian Forest are well represented at this site. Two significant species were recorded in this site, Tussock Grass (*Poa petrophila*) and Tingaringy Gum (*E. glaucescens*).	Entire site is protected in SPZ
Site 3c	Wombat Track	This site is a representative example of Snow Gum Woodland, as well as supporting a significant Tussock Grass (*Poa sieberiana* var. *cyanophylla*).	Entire site is protected in SPZ

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Site No	Site Names	Botanical Values	Management of values found within each site
Site 1d	Fainter Creek	This site supports many significant flora species including; Catkin Wattle (*A. dellachiana*), Velvety Geebung (*Persoonia subvelutina*), Bogong Gum (*E. chapmaniana*) Cliff Cudweed (*Gnaphalium umbricola*) and Mountain Plum Pine (*Podocarpus lawrencei*). Significant stands of Montane Riparian Forest and Montane Forest also occur in this site.	Entire site is in Alpine National Park
Site 2d	Between Rocky Valley and Mt Cope	Alpine Heathland occupies this site. The presence of the Vulnerable and restricted subspecies of Eyebright (*Euphrasia crassiuscula* spp. *glandulifera*) is significant.	Entire site is in Alpine National Park
Site 3d	Mt Arthur and Mt Little Arthur	The only known population of Shining Westringia (*Westringia lucida*) occurs at this site. Samples of Snow Gum Woodland and Montane Forest support significant flora including the subspecies of Eyebright (*Euphrasia crassiuscula* spp. e*glandulosa*) and Bogong Daisy-bush (*Olearia frostii*)	Entire site is in Alpine National Park
Site 4d	Pretty Valley Creek and Tawonga Hut Creek	Representative stands of Alpine Wet Heathland, Snow Gum Woodland, Montane Forest and Montane Riparian Forest occur in this site. Twelve significant plant species were recorded; Silky Daisy (*Celmisia sericophylla*), Green Bird-orchid (*Chiloglottis cornuta*), Bent-grass (*Deyeuxia gunniana*), Woodrush (*Luzula acutifolia*), Bogong Daisy-bush (*Olearea frostii*), Bogong Gum (*E.chapmaniana*), Pterostylis (*Pterostylis oreophila*), Mountain Plum Pine (*Podocarpus lawrencei*), Catkin Wattle (*Acacia dallachiana*), Velvety Geebung (*Persoonia subvelutina*), Cliff Cudweed (*Gnaphalium umbricola*) and Woodrush (*Luzula ovata*).	Entire site is in Alpine National Park
Site 5d	East of Lake Guy	This site supports representative examples of Montane Forest, Wet Sclerophyll Forest and Damp Sclerophyll Forest. Two significant species were found, Bogong Gum (*E. chapmaniana*) and Reflexed Bedstraw (*Galium binifolium*).	Entire site is in Alpine National Park
Site 6d	East of Clover Dam	Fern Gully, Wet Sclerophyll Forest and Damp Sclerophyll Forest are represented in this site. Significant species include Bogong Gum (*E. chapmaniana*) and Kangaroo Fern (*Microsorium diversifolium*) and Twining Silkpod (*Parsonsia brownii*).	Entire site is in Alpine National Park
Site 7d	Clover Forest Block north	Snow Gum Woodland, Montane Forest, Fern Gully, Wet Sclerophyll Forest Damp Sclerophyll Forest, Dry Sclerophyll Forest and Montane Riparian Forest. Significant plant species include a subspecies of Calandenia (*Calandenia* sp. nov. aff. *Reticulata*), a subspecies of Eyebright (*Euphrasia crassiuscula* ssp. *Eglandulosa*), Austral Ground-fern (*Hypolepis australis*), Bogong Gum (*E. Chapmaniana*) and Cliff Cudweed (*Gnaphalium umbricola*).	Entire site is in Alpine National Park

Definitions:

Site numbers

a = Sites occurring in the Saltpetre Forest Block, North East Region (DCE 1992)
b = Sites occurring in the Mount Murray Forest Block, North East Region (CFL 1987a)
c = Sites occurring in the Razorback and Dartmouth Forest Blocks, North East Region (CFL 1987b)
d = Sites occurring in the Clover and Pretty Valley Forest Blocks. North East Region (CFL 1988)

APPENDIX K

MANAGEMENT OF VICTORIAN AND COMMONWEALTH RARE OR THREATENED FLORA OCCURRING IN STATE FOREST IN THE NORTH EAST

Flora listed (or recommended for listing) as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act* (1999) and the Victorian *Flora and Fauna Guarantee Act* (1988)

Species Name	Common Name	Status[1]	Zone	Management[2]
Dipodium hamiltonianum	Yellow Hyacinth-orchid	e	SPZ	
Discaria pubescens	Hairy Anchor Plant	**R**, v	SMZ	
Eucalyptus cadens	Warby Range Swamp Gum	**V**, v	SMZ	
Euphrasia scabra	Rough Eyebright	**K**, e	SPZ	Action Statement
Goodenia macbarronii	Narrow Goodenia	**V**, v	SPZ	
Pomaderris subplicata	Concave Pomaderris	**V**, v	SMZ	
Pterostylis cucullata	Leafy Greenhood	**V**, v	SMZ	
Thesium australe	Austral Toad-flax	**V**, e	SPZ	
Acacia deanei ssp. *deanei*	Deanes Wattle	e	SPZ	
Euphrasia collina ssp. *muelleri*	Purple Eyebright	**E**, e	SPZ	
Swainsona recta	Mountain Swainson-pea	**E**, e	SPZ	200m SPZ
Thelypteris confluens	Swamp Fern	**K**, e	SPZ	
Almaleea capitata	Slender Parrot-pea	**R**, v	SMZ	
Brachyscome gracilis ssp. *gracilis*	Dookie Daisy	v	SMZ	
Diuris punctata	Purple Diuris	v	SMZ	Field inspection
Eucalyptus mitchelliana	Buffalo Sallee	**R**, r	SMZ	
Glycine latrobeana	Clover Glycine	**V**, v	SMZ	
Pultenaea lapidosa	Stony Bush-pea	v	SMZ	

OTHER VICTORIAN RARE OR THREATENED FLORA SPECIES

Species Name	Common Name	Status[1]	Zone	Management[2]
Carex hypandra	Alpine Fen-sedge	e	SPZ	
Corybas hispidus	Bristly Helmet-orchid	r	SPZ	
Cystopteris tasmanica	Brittle Bladder-fern	**R**, r	SPZ	
Diuris dendrobioides	Wedge Diuris	e	SPZ	
Eragrostis exigua	Slender Love-grass	e	SPZ	200m SPZ
Leptorhynchos elongatus	Lanky Buttons	e	SPZ	
Olearia frostii	Bogong Daisy-bush	**R**, r	SPZ	
Prasophyllum canaliculatum	Summer Leek-orchid	e	SPZ	
Pterostylis oreophila	Blue-tongue Greenhood	e	SPZ	
Acacia alpina	Alpine Wattle	r	SMZ	
Acacia boormanii	Snowy River Wattle	r	SMZ	
Acacia dallachiana	Catkin Wattle	**R**, r	SMZ	
Acacia dawsonii	Poverty Wattle	v	SMZ	
Acacia deanei (unspecified ssp.)	Deanes Wattle	r	SMZ	
Acacia doratoxylon	Currawang	r	SMZ	
Acacia flexifolia	Bent-leaf Wattle	r	SMZ	
Acacia lanigera var. *lanigera*	Woolly Wattle	r	SMZ	
Aciphylla glacialis	Snow Aciphyll	v	SMZ	
Agrostis australiensis	Tiny Bent	r	SMZ	
Agrostis muelleriana	Muellers Bent	r	SMZ	
Alchemilla sp. 1	Ladys Mantle	r	SMZ	
Ammannia multiflora	Jerry-jerry	v	SMZ	
Asplenium trichomanes	Common Spleenwort	r	SMZ	Field inspection
Astrotricha linearis	Narrow-leaf Star-hair	r	SMZ	
Australopyrum retrofractum	Comb Wheat-grass	r	SMZ	
Austrodanthonia pilosa var. *paleacea*	Large Velvet Wallaby-grass	r	SMZ	
Barbarea grayi	Native Wintercress	v	SMZ	
Billardiera scandens var. *brachyantha*	Velvet Apple-berry	r	SMZ	
Bossiaea bracteosa	Mountain Leafless Bossiaea	r	SMZ	

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Other Victorian Rare or Threatened Flora Species continued

Species Name	Common Name	Status[1]	Zone	Management[2]
Bossiaea riparia	River Leafless Bossiaea	r	SMZ	
Botrychium australe	Austral Moonwort	v	SMZ	
Brachyscome ptychocarpa	Tiny Daisy	r	SMZ	
Callitriche umbonata	Winged Water-starwort	v	SMZ	
Cardamine lilacina s.s.	Lilac Bitter-cress	v	SMZ	
Carex archeri	Archers Sedge	v	SMZ	
Colobanthus affinis	Alpine Colobanth	r	SMZ	
Cyperus flavidus	Yellow Flat-sedge	v	SMZ	
Deyeuxia crassiuscula	Thick Bent-grass	r	SMZ	
Digitaria divaricatissima	Umbrella Grass	v	SMZ	
Diplaspis nivis	Snow Pennywort	r	SMZ	
Dodonaea boroniifolia	Hairy Hop-bush	r	SMZ	
Dodonaea rhombifolia	Broad-leaf Hop-bush	**R**, r	SMZ	
Epacris celata	Cryptic Heath	r	SMZ	
Eucalyptus alligatrix ssp. *alligatrix*	Silver Stringybark	**R**, r	SMZ	
Eucalyptus cinerea ssp. *cinerea*	Beechworth Silver Stringybark	v	SMZ	
Eucalyptus glaucescens	Tingaringy Gum	r	SMZ	
Eucalyptus kybeanensis	Mallee Ash	r	SMZ	
Eucalyptus neglecta	Omeo Gum	**R**, r	SMZ	
Eucalyptus perriniana	Spinning Gum	r	SMZ	
Eucalyptus sideroxylon s.s.	Mugga	r	SMZ	
Euchiton umbricolus	Cliff Cudweed	r	SMZ	
Euphrasia caudata	Tailed Eyebright	r	SMZ	
Euphrasia lasianthera	Hairy Eyebright	r	SMZ	
Genoplesium nudum	Tiny Midge-orchid	r	SMZ	
Geranium sessiliflorum ssp. *brevicaule*	Alpine Cranesbill	r	SMZ	
Geranium sp. 6	Delicate Cranesbill	v	SMZ	
Grammitis poeppigiana	Alpine Finger-fern	r	SMZ	
Grevillea brevifolia	Cobberas Grevillea	r	SMZ	
Grevillea polybractea	Crimson Grevillea	r	SMZ	
Grevillea victoriae s.s.	Royal Grevillea	r	SMZ	
Grevillea willisii	Rock Grevillea	**R**, r	SMZ	
Gynatrix macrophylla	Gippsland Hemp Bush	r	SMZ	
Huperzia australiana	Fir Clubmoss	r	SMZ	
Hybanthus monopetalus	Slender Violet-bush	r	SMZ	
Indigofera adesmiifolia	Tick Indigo	v	SMZ	
Isolepis congrua	Slender Club-sedge	v	SMZ	
Isolepis montivaga	Fog Club-sedge	r	SMZ	
Juncus brevibracteus	Alpine Rush	r	SMZ	
Juncus falcatus	Sickle-leaf Rush	r	SMZ	
Juncus psammophilus	Sand Rush	r	SMZ	Field inspection
Leptospermum multicaule	Silver Tea-tree	v	SMZ	
Lespedeza juncea ssp. *sericea*	Chinese Lespedeza	r	SMZ	
Leucopogon attenuatus	Grey Beard-heath	r	SMZ	
Leucopogon montanus	Snow Beard-heath	r	SMZ	
Lipocarpha microcephala	Button Rush	v	SMZ	
Lomandra oreophila	Mountain Mat-rush	r	SMZ	
Luzula alpestris	Tussock Woodrush	r	SMZ	
Lycopodium scariosum	Spreading Clubmoss	r	SMZ	
Ophioglossum petiolatum	Stalked Adders-tongue	r	SMZ	
Oschatzia cuneifolia	Wedge Oschatzia	**R**, r	SMZ	
Oxalis magellanica	Snowdrop Wood-sorrel	r	SMZ	
Persoonia subvelutina	Velvety Geebung	r	SMZ	
Phebalium squamulosum ssp. *alpinum*	Alpine Phebalium	r	SMZ	
Pimelea ligustrina ssp. *ciliata*	Fringed Rice-flower	r	SMZ	
Pimelea treyvaudii	Grey Rice-flower	v	SMZ	
Poa petrophila	Rock Tussock-grass	v	SMZ	
Poa sieberiana var. *cyanophylla*	Blue-leaf Tussock-grass	r	SMZ	
Polygala japonica	Dwarf Milkwort	v	SMZ	

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Other Victorian Rare or Threatened Flora Species continued

Species Name	Common Name	Status[1]	Zone	Management[2]
Pomaderris aurea	Golden Pomaderris	r	SMZ	
Pomaderris helianthemifolia	Blunt-leaf Pomaderris	r	SMZ	
Pomaderris subcapitata	Convex Pomaderris	r	SMZ	
Prasophyllum patens	Broad-lip Leek-orchid	r	SMZ	
Prostanthera decussata	Dense Mint-bush	r	SMZ	
Pterostylis aestiva	Long-tongue Summer Greenhood	r	SMZ	
Pterostylis fischii	Fischs Greenhood	r	SMZ	
Pterostylis hamata	Scaly Greenhood	r	SMZ	
Pterostylis laxa	Antelope Greenhood	r	SMZ	
Pultenaea foliolosa	Small-leaf Bush-pea	r	SMZ	
Pultenaea platyphylla	Flat-leaf Bush-pea	r	SMZ	
Pultenaea polifolia	Dusky Bush-pea	r	SMZ	
Pultenaea tenella	Delicate Bush-pea	r	SMZ	
Pultenaea vrolandii	Cupped Bush-pea	r	SMZ	
Pultenaea williamsonii	Highland Bush-pea	**K**, r	SMZ	
Ranunculus eichlerianus	Eichlers Buttercup	**R**, r	SMZ	
Ranunculus gunnianus	Gunns Alpine Buttercup	r	SMZ	
Ranunculus millanii	Dwarf Buttercup	r	SMZ	
Rulingia dasyphylla	Kerrawang	v	SMZ	
Rytidosperma nivicolum	Snow Wallaby-grass	r	SMZ	
Schizeilema fragoseum	Alpine Pennywort	v	SMZ	Field inspection
Scleranthus fasciculatus	Spreading Knawel	r	SMZ	
Scleranthus singuliflorus	Mossy Knawel	r	SMZ	
Senecio pectinatus var. *major*	Alpine Groundsel	r	SMZ	
Stackhousia pulvinaris	Alpine Stackhousia	r	SMZ	
Thelymitra simulata	Graceful Sun-orchid	r	SMZ	
Trochocarpa clarkei	Lilac Berry	r	SMZ	
Uncinia nemoralis	River Hook-sedge	r	SMZ	
Wurmbea biglandulosa ssp. *biglandulosa*	Glandular Early Nancy	r	SMZ	
Agrostis avenacea var. *perennis*	Wetland Blown-grass	k		
Arthropodium sp. 2 (greenish flowers)	Greenish-flower Vanilly-lily	k		
Arthropodium sp. 3 (aff. strictum)	Small Chocolate-lily	k		
Baumea planifolia	Rough Twig-sedge	k		
Callitriche palustris	Swamp Water-starwort	k		
Cardamine tenuifolia	Slender Bitter-cress	k		
Carex iynx	Tussock Sedge	k		
Craspedia alba	White Billy-buttons	**R**, k		Field inspection
Desmodium varians	Slender Tick-trefoil	k		
Gonocarpus micranthus ssp. *ramosissimus*	Branching Raspwort	k		
Lepidosperma gunnii	Slender Sword-sedge	k		
Leucopogon juniperinus	Long-flower Beard-heath	k		
Myriophyllum lophatum	Crested Water-milfoil	k		
Pterostylis aciculiformis	Slender Ruddyhood	k		
Pterostylis bicolor	Black-tip Greenhood	k		
Ranunculus pumilio var. *politus*	Ferny Small-flower Buttercup	k		
Sparganium subglobosum	Floating Bur-reed	k		

Definitions:

[1]Status

VROT categories:
- e – endangered
- v – vulnerable
- r – rare
- d – depleted
- k – insufficient known

Commonwealth *Endangered Species Protection* Act (1992) categories:
- E – Endangered
- V – Vulnerable

[2]Management

Action Statement:	Protection measures are in accordance with the Action Statement.
200m SPZ:	Establish a 200m radius SPZ around known populations.
Field inspection:	Field inspection to determine appropriate protection measures is required prior to any disturbance proposed in the vacinity of the record.

APPENDIX L

MANAGEMENT OF VICTORIAN AND COMMONWEALTH RARE OR THREATENED FAUNA OCCURRING IN STATE FOREST IN THE NORTH EAST

Rare or Threatened Terrestrial Fauna Species

Species Name	Common Name	Status[1]	Management
Mammals			
Dasyurus maculatus	Spot-tailed Quoll	e, **V**	See Conservation Guideline, Chapter 3
Phascogale tapoatafa	Brush-tailed Phascogale	v	See Conservation Guideline, Chapter 3
Potorous longipes	Long-footed Potoroo	e, **E**	See Conservation Guideline, Chapter 3
Burramys parvus	Mountain Pygmy Possum	e, **V**	Presently this species is not recorded in State forest. As an interim measure, any populations discovered will be included in the SMZ. A SMZ plan will need to be prepared prior to harvesting activities or prescribed burns proceeding
Petaurus norfolcensis	Squirrel Glider	e	See Conservation Guideline, Chapter 3
Mastacomys fuscus	Broad-toothed Rat	lr	Preferred habitats include dense sedges and grasses, often along drainage lines and will generally be protected by *Code* prescriptions. Coupe plans should protect preferred habitat areas near known records
Pseudomys fumeus	Smoky Mouse	e	See Conservation Guideline, Chapter 3
Rhinolophus megaphyllus	Southern Horseshoe bat	v	See Conservation Guideline, Chapter 3
Myotis macropus	Southern Myotis	lr	See Conservation Guideline, Chapter 3
Miniopteris schreibersii	Southern Bent-wing Bat	v	See Conservation Guideline, Chapter 3
Birds			
Lophoictinia isura	Square-tailed Kite	e	100 m buffer around nest sites that have been used in the last 5 years. No harvesting or prescribed burns within 250 m of nest site during breeding season
Accipiter novaehollandiae	Grey Goshawk	lr	100 m buffer around nest sites that have been used in the last 5 years. No harvesting or prescribed burns within 250 m of nest site during breeding season
Ninox connivens	Barking Owl	e	See Conservation Guideline, Chapter 3
Neophema pulchella	Turquoise Parrot	lr	Stumps identified as nest sites to be protected. Firewood collection to be managed to ensure retention of sufficient coarse woody debris on the forest floor
Ninox strenua	Powerful Owl	e	See Conservation Guideline, Chapter 3
Tyto novaehollandiae	Masked Owl	e	See Conservation Guideline, Chapter 3
Tyto tenebricosa	Sooty Owl	v	See Conservation Guideline, Chapter 3
Calyptorhinchus lathami	Glossy Black-Cockatoo	v	Presently, these bird species have not been recorded in State forest. As an interim measure, any resident populations discovered will be included in the SMZ. A SMZ plan will need to be prepared prior to harvesting activities or prescribed burns proceeding
Haliaeetus leucogaster	White-bellied Sea-eagle	e	
Struthidea cinerea	Apostlebird	v	
Lathamus discolor	Swift Parrot	e, **E**	
Grantiella picta	Painted Honeyeater	v	
Xanthomyza phrygia	Regent Honeyeater	ce, **E**	
Pomatostomus temporalis	Grey-crowned Babbler	e	
Burhinus grallarius	Bush Stone-curlew	e	

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Management of Victorian and Commonwealth rare or threatened fauna continued

Species Name	Common Name	Status[1]	Management
Reptiles			
Pseudemoia cryodroma	Alpine Bog Skink	v	Conservation of all wetlands in SPZ and FMA Timber Harvesting Prescriptions provide adequate protection
Cyclodomorphus praealtus	Alpine She-oak Skink	ce	Conservation of all wetlands in SPZ and FMA Timber Harvesting Prescriptions provide adequate protection
Eulamprus kosiuskoi	Alpine Water Skink	ce	Conservation of all wetlands in SPZ and FMA Timber Harvesting Prescriptions provide adequate protection
Morelia spilota variegata	Carpet Python	e	Presently this species is not recorded in State forest. As an interim measure, any populations discovered will be included in the SMZ. A SMZ plan will need to be prepared prior to harvesting activities proceeding
Vermicella annulata	Bandy Bandy	lr	See Conservation Guideline, Chapter 3
Ramphotyphlops proximus	Woodland Blind Snake	v	See Conservation Guideline, Chapter 3
Amphibians			
Litoria spenceri	Spotted Tree Frog	ce, **E**	See Conservation Guideline, Chapter 3
Litoria verreauxii alpina	Alpine Tree Frog	ce	Presently this species is not recorded in State forest. As an interim measure, any populations discovered will be included in SMZ. A SMZ plan will need to be prepared prior to harvesting activities or prescribed burns proceeding
Fish			
Galaxias fuscus	Barred Galaxias	ce	See Conservation Guideline, Chapter 3
Maccullochella macquariensis	Trout Cod	ce	FMA Timber Harvesting Prescriptions provide adequate protection
Maccullochella peelii peelii	Murray Cod	v	FMA Timber Harvesting Prescriptions provide adequate protection
Macquaria australasica	Macquarie Perch	e	FMA Timber Harvesting Prescriptions provide adequate protection
Gadopsis marmoratus	River Blackfish	dd	FMA Timber Harvesting Prescriptions provide adequate protection
Galaxias olidus	Mountain Galaxias	dd	See Conservation Guideline, Chapter 3
Galaxias rostratus	Flat-headed Galaxias	dd	FMA Timber Harvesting Prescriptions provide adequate protection
Macquaria ambigua	Golden Perch	v	FMA Timber Harvesting Prescriptions provide adequate protection
Insects			
Thaumatoperla flaveola	Alpine (Stirling) Stonefly	v	See Conservation Guideline, Chapter 3

Definitions:

[1]Status:

Commonwealth

Commonwealth Endangered Species Protection Act (ESP) categories:

- E Endangered
- V Vulnerable

Victorian

Vertebrates:

Threatened Vertebrate Fauna in Victoria (NRE 2000)

- ce critically endangered
- e endangered
- v vulnerable
- lr lower risk – near threatened
- dd data deficient

Invertebrates:

Threatened Fauna in Victoria (CNR 1995h)

- e endangered
- v vulnerable
- r rare
- k insufficiently known

APPENDIX M

POWERFUL OWL AND SOOTY OWL PREDICTIVE HABITAT MODELS

Owls and arboreal mammals were surveyed in autumn/winter 1996 at 472 sites in North East Victoria and 207 sites in the Tambo region of Gippsland, using playback of owl calls. Sites were selected by stratified random sampling across all tenures of public land (e.g. State forest and National Parks). This produced records of six owl species: Southern Boobook (from 340 sites), Powerful Owl (121), Sooty Owl (44), Barking Owl (12), Barn Owl (5), and Masked Owl (3). Habitat data were also obtained at four spatial scales from forest survey information (NRE Geographic Information System (GIS) data) available for North East Victoria but not for Gippsland. Hence analysis at this stage has focused mainly on North East Victoria.

The survey demonstrated a broad but patchy distribution for some of these species, with patterns related to Ecological Vegetation Classes (EVCs) and other factors (including gradients of altitude and rainfall, as recognised in previous work). It emerged that Sooty Owls were quite widely distributed in both regions, whereas previous records came mainly from East Gippsland and the Central Highlands with few records in between or far north of the Great Divide. Sooty Owls were not confined to their traditional wet gully habitats, although they generally favoured wetter forest than other owls. Powerful Owls were found in a wide range of forest types including several sites in River Red Gum forest along the Ovens and Goulburn Rivers, which had not previously been recognised as an important habitat.

Data on Powerful and Sooty Owls in North East Victoria were modelled using logistic regression, with a range of habitat and context data as independent variables. The models suggest Powerful Owls were most likely to be observed at sites with Shrubby Dry Forest, a high diversity of EVCs within 2km, extensive mature forest within 5km, not much senescent or pure regrowth forest within 5km, and many live hollow-bearing trees near the point of playback. Sooty Owls appeared most likely to be observed at sites with Herbrich Foothill Forest and mixed mature/senescent growth-stage, with extensive mature forest within 500m and senescent forest within 5km, and not much of the drier forest types within 500m. Generally, they favoured wetter forest than Powerful Owls, with little overlap. Several other factors made non-significant contributions to the preferred models. Inspection of data suggested that Powerful Owls favoured sites with riparian forest or Blackwoods, and Sooty Owls favoured sites with Damp Forest, tree-ferns, Blanketleaf and Silver Wattle (as assessed near the point of playback). Both species favoured sites with abundant arboreal mammals.

Models based on mapped variables were fed back onto GIS and used to predict areas where each owl species was most likely to be found. These models were then tested in the field at 64 new sites. Field tests showed that each owl species was substantially more likely to be found at sites of high rather than low predicted probability of occurrence.

The probability maps have been used along with other information to select areas designated in either State forest or the formal reserve system for special management for Powerful and Sooty Owls. This approach will help conserve owls, prey species and elements of old forest within these designated areas. These areas were selected from predicted sites with high probability of occurrence, across all public land tenures. Areas of at least 500 ha were identified to include substantial areas of high-predicted probability, as well as favoured EVCs and growth stages. The strategy will be reviewed along with the Plan and as new information becomes available.

The distribution of high probability areas for Powerful Owl and Sooty Owl in the CAR reserve system in the North East is shown in the table below.

Powerful Owl and Sooty Owl High Probability Areas

Owl Species	**High Probability**	**High Probability Area protected**			**Total Area Protected**	
	Area (Ha)	**Park/Reserves**	**SPZ**	***Code* Prescriptions**	**Area (Ha)**	**%**
Powerful Owl	184 721	50 331	32 477	20 684	103 493	57
Sooty Owl	176 845	71 033	27 934	21 532	120 499	68

Note: High probability areas are those areas indicated by the models to have the highest probability of locating owls**.**

APPENDIX N

TIMBER RESOURCE AREA STATEMENT FOR THE NORTH EAST

FMA	Product	[1]Code (ha)	GMZ (ha)	SMZ (ha)	SPZ (ha)	Total (ha)
Benalla–Mansfield	Alpine Ash	3 173	7 959	190	1 376	12 698
	Mixed Species	10 544	40 947	4 729	11 860	68 080
	[2]Other	13 323	51 242	1 885	17 760	85 210
	Sub Total	**27 040**	**100 148**	**6 804**	**31 996**	**165 988**
North East (Wangaratta and part Wodonga FMAs)	Alpine Ash	7 033	20 855	2 037	3 805	33 730
	Mixed Species	28 412	80 309	6 226	37 058	152 004
	Other	53 180	186 878	7 004	98 176	345 238
	Sub Total	**88 625**	**288 042**	**15 267**	**139 038**	**530 972**
Total		**115 665**	**388 190**	**22 071**	**171 034**	[3]**696 960**

Source: Statewide Forest Resource Inventory (NRE 1997f).

Notes:

1. Area excluded from timber harvesting in compliance with the *Code of Forest Practices for Timber Production* (NRE 1996a) .
2. This category includes non productive areas comprising non eucalypt species, unclassified, non treed, non vegetated, and other miscellaneous areas.
3. This figure varies from Table 2.1 due to rounding functions used to derive the data.

APPENDIX O

SPECIAL WATER SUPPLY CATCHMENT AREAS AND DESIGNATED CATCHMENTS IN THE NORTH EAST

Special Water Supply Catchment Areas

Catchment Area	Region/Town Supplied
Upper Goulburn	
–Upper Goulburn	Upper Delatite
– Lake Eildon	Environs
Honey Suckle Creek	Violet Town
Seven Creeks	Euroa
Fifteen Mile Creek	Glenrowan
Lake Nillahcootie	
Ryans Creek	Benalla
Ovens River	Wangaratta
King River	Lake William Hovell
Nine Mile Creek	Longwood
Nine Mile Creek	Beechworth and Yackandandah

Catchment Area	Region/Town Supplied
Barambogie Creek	Chiltern
Buffalo River	Lake Buffalo
Upper Kiewa	
–Upper Kiewa	East Kiewa U2
Lake Hume – part	
–Lake Hume	Northern Section
Bakers Gully	Bright
Ovens River	Bright
Buckland River	
Mitchell River – part	
Diddah Diddah Creek	Springhurst

Designated Catchments

Water Supply Catchment	Total Area (ha)	State forest (%)[1]	Catchment Authority	Principal district supplied	Comments
Mount Tabor Creek	1 141	93%	North East Catchment Management Authority	Dartmouth	Water is Chlorinated
Black Dog Creek	907	73%	North East Catchment Management Authority	Chiltern	
Ryans Creek	7 916	73%	Goulburn–Broken Catchment Management Authority	Benalla	Water is Chlorinated Has a Special Area Plan
Bakers Gully Creek	825	56%	North East Catchment Management Authority	Bright	Water is Chlorinated. Special Water Supply Catchment Area
West Kiewa River	13 975	55%	North East Catchment Management Authority	Mt Beauty and Tawonga	Ultra Violet Disinfection
Musk Gully Creek	1 432	49%	North East Catchment Management Authority	Whitfield	Untreated
Diddah Diddah Creek	1 889	22%	North East Catchment Management Authority	Springhurst	Untreated. Special Water Supply Catchment Area

Note: 1. Proportion of State forest in Total Catchment Area.

APPENDIX P

CAUSE AND AREA OF WILDFIRES OCCURRING ON PUBLIC LAND IN THE NORTH EAST

Causes of Wildfires on Public Land, 1977/78 to 1996/97

Cause of Fire	Number of Fires	Proportion of Total No. of Fires (%)	Hectares Burnt	Proportion of Total Area (%)
Lightning	717	42	105 985	77
Campfire/barbecue escape	89	5	934	1
Deliberate	169	10	8 877	6
Burning off	207	12	9 332	6
Waste disposal	50	3	11	0
Relight	73	4	2 908	2
Other[1]	282	17	10 371	8
Unknown	120	7	215	1
Total	1 707	100	138 633	100

Note: 1. Include ignition through; exhaust, snigging, hauling, burning vehicles, cigarettes, matches, train, power transmission, fireworks and remote house fires.

Major Wildfires[1] on Public Land in the North East, 1978–1997

Fire Season	Region	Fire District	Area of Public Land Burnt (ha)	Total Area burnt (ha)
1978	Wangaratta	Upper Murray	4 090	4 100
1978	Wangaratta	Upper Murray	7 500	8 500
1978	Central Gippsland	Ovens	4 500	4 500
1978	Wangaratta	Ovens	4 500	4 500
1980	Wangaratta	Upper Murray	7 000	7 000
1982	Wangaratta	Ovens	100	400
1982	Wangaratta	Upper Murray	600	600
1982	Wangaratta	Ovens	590	675
1983	Wangaratta	Ovens	613	680
1983	Alexandra	Mansfield	750	750
1985	Wangaratta	Ovens	2 000	2 002
1985	Alexandra	Mansfield	2 400	2 400
1985	Wangaratta	Ovens	390	1 800
1985	Wangaratta	Ovens	5 000	5 000
1985	Wangaratta	Ovens	16 800	18 500
1985	Wangaratta	Ovens	52 730	53 030
1985	Wangaratta	Upper Murray	7 000	9 000
1985	Central Gippsland	Ovens	800	800
1986	Wangaratta	Ovens	850	850
1987	Bendigo	Mansfield	762	762
1988	North East	Ovens	900	900
1990	Benalla	Mansfield	2 380	7 430
1990	Alexandra	Mansfield	770	770
1991	North East	Ovens	600	600
1991	North East	Mid Murray	650	650
1997	Alexandra	Mansfield	715	735
1997	Wangaratta	Ovens	690	690
1997	Wangaratta	Ovens	467	467
Total			**4 274**	**4 349**

Note: 1. Wildfires greater than 400 ha.

APPENDIX Q

REGIONALLY CONTROLLED AND REGIONALLY PROHIBITED WEEDS OCCURRING IN THE NORTH EAST

Regionally Controlled Weeds

Species	Common Name
Amsinckia spp	Amsinckia
Xanthium spinosum	Bathurst Burr
Convolvulus arvensis	Bindweed
Rubus fruiticosus	Blackberry
Tribulus terrestris	Caltrop
Genista monspessulana	Cape Broom
Ibicella lutea	Devil's Claw
Cuscata spp.	Dodder
Cystisus scoparius	English Broom
Ulex europaeus	Furze/Gorse
Verbascum thapsus	Great Mullein
Craaegus monogvna	Hawthorn
Conium maculatum	Hemlock
Marribium vulgare	Horehound
Xanthium strumarium	Noogoora Burr/ Californian Burr
Leucantheumum strumarium	Ox-eye Daisy
Echium plantagineum	Paterson's Curse
Opunta culgaris	Prickly Pear (drooping)
Opunta stricta	Prickly Pear (erect)
Carthamus lanatus	Saffron Thistle
Onopordum acanthium	Scotch/Heraldic Thistle

Species	Common Name
Chrondrilla juncea	Skeleton Weed
Carduua tennuiflorus	Slender/Shore Thistle
Circium vulgare	Spear Thistle
Juncus acutus	Spiny Rush
Centaurea solstitialis	St. Barnaby's Thistle
Hypericum perforatum	St. John's Wort
Dittrichia graveolens	Stinkwort
Rosa rubiginosa	Sweet Briar
Datura stramonium	Thorn Apple (common)
Datura ferox	Thorn Apple (long spine)
Datura innoxia	Thorn Apple (recurved)
Lavendula stoechas	Topped Lavender
Ailanthus altissima	Tree of Heaven
Hypericum androsaemum	Tutsan
Silybum marianum	Variegated Thistle
Echium vulgare	Viper's Bugloss
Opuntia rovusta	Wheel Cactus
Allium vineale	Wild Garlic
Reseda luteola	Wild Mignonette
Dipsacus fullonum	Wild Teasel
Watsonia meriana	Wild Watsonia

Regionally Prohibited Weeds

Botanical Name	Common Name
Senecio pterophorus	African Daisy
Eragrostis curvula	African Lovegrass
Solanum linnaeanum	Apple of Sodom
Lycium ferocissimum	Boxthorn
Cirsium arvense	Californian/Perennial Thistle
Homeria miniata	Cape Tulip (two-leaf)
Homeria flaccida	Cape tulip (one-leaf)
Cestrum parqui	Chilean Cestrum

Botanical Name	Common Name
Proboscidea louisianica	Devil's Claw (purple-flower)
Onopordum illyricum	Illyrian Thistle
Physalis viscosa	Prairies Ground Cherry
Nassella trichotoma	Serrated Tussock
Solanum elaeagnifolium	Silver Leaf Nightshade
Cenchrus longispinus	Spiny Burr Grass/ Gentle Annie
Centaurea calcitrapa	Star Thistle

Significant Environmental Weeds

Botanical Name	Common Name
Vinca major	Blue Periwincle
Leycesteria foroms	Himalyan Honeysuckle
Ulmus sp.	Cork Elm

Note: In addition to Environmental Weeds already listed as Regionally Controlled or Regionally Prohibited Weeds.

State Prohibited Weed

Botanical Name	Common Name
Centaurea nigra	Blacknap Weed

APPENDIX R

TWO-WHEEL DRIVE AND FOUR-WHEEL DRIVE TOURING ON FOREST ROADS PROMOTED IN NRE AND AFFILIATED LITERATURE

FOREST DRIVES

Roads signposted and/or promoted in NRE or NRE-supported brochures, and suitable for the conventional family car in normal seasonal and weather conditions.

Name/location	Explanatory brochure
Beechworth Forest Drive	Beechworth State forest – forest walks and drives
Yackandandah Scenic Forest Drive	Yackandandah Touring Guide (Indigo Shire)
Omeo Highway Historic Drive – Mitta Mitta to Omeo	Omeo Highway – Forest walks and drives

4WD TOURING

Access through State forest to the Alpine National Park is an integral part of tours promoted in (Australian Alps Liaison Committee 1998).
Routes listed include:

- Buffalo River Road (Dandongadale, Catherine Station to the Park);
- Buckland valley;
- Rose River Road, Lake Cobbler Track; and
- Circuit Road, Speculation Road, Bindaree Road.

Mansfield 4WD Country 4x4 Discovery Tours

Track notes and interpretive materials have been published on these six tour routes based on one-day return tours out of Mansfield on well-used and well-maintained tracks. Tour routes include some roads managed by Delatite Shire and Parks Victoria. The routes are:

- Mansfield / Steiners Road / Mitchells Homestead / Wren's Flat / Mt Sunday / Low Saddle Road / Sheepyard Flat / Mansfield;
- Mansfield / Carters Road / No.3 Track / Craig Hut / The Monument / Bindaree / Bluff / Sheepyard Flat / Mansfield;
- Mansfield / Sheepyard Flat / Bluff / Cairn Creek Track / Brocks Road / Sheepyard Flat / Mansfield;
- Mansfield / Telephone Box Junction / King Basin Road / Speculation Track / Lake Cobbler / Whitfield / Power's Lookout / Mansfield;
- Mansfield / Delatite Arm Reserve / Highett Ridge / SEC Track / Mansfield; and
- Mansfield / Jamieson / German Spur / Weber Spur / Champion Spur / Woods Point / Jamieson / Mansfield.

Corryong 4WD Touring

The Upper Murray Touring Map & Visitors Guide (1998) is distributed by the Towong Shire Council. It features a map showing many roads and tracks in State forest and Park, along with the location of campsites, huts, historic mine sites, fishing spots and information on attractions and accommodation. No specific tour routes are promoted.

APPENDIX S

MANAGEMENT OF RECREATION SITES AND WALKING TRACKS

Benalla/Mansfield FMA

Benalla Area

Recreation Site	Toilets	Fire-places	Picnic Tables	Inform-ation	Camping	SPZ Buffer	Comments
Stringybark Creek	Yes	Yes	Yes		Yes	50	
James Reserve	Yes	Yes	Yes		Yes	50	
Jones	Yes	Yes	Yes		Yes	50	
Kelly Tree	Yes	Yes	Yes			50	Improve signage and interpretation
Toombullup North School Site	Yes	Yes	Yes		Yes	50	

Walking Track	Length (km)	Class*	Signs	Track Notes	Camping	SPZ Buffer	Comments
Lima Creek Track	2	Easy - Mod	Yes			50	
Lima Creek Falls Track	4	Easy -Mod	Yes			50	Lookout
Leerson Hill Track	3.2	Easy - Mod	Yes			50	

Mansfield Area

Recreation Site	Toilets	Fire-places	Picnic Tables	Inform-ation	Camping	SPZ Buffer	Comments
Craig Hut	Yes		Yes		Yes	200	
Running Creek	Yes				Yes	50	
Grannys Flat	Yes	Yes			Yes	50	
Blue Range Creek	Yes	Yes	Yes		Yes	50	
Carters Road	Yes	Yes	Yes		Yes	50	Short historic timber tramway walk
Buttercup Creek					Yes	50	Bush camping
Knockwood Reserve	Yes				Yes	50	
Wrens Flat					Yes	50	Upgrade facilities
Snake Reserve	Yes	Yes			Yes	50	
12 Mile Reserve	Yes	Yes	Yes		Yes	50	
Tunnel Bend	Yes	Yes	Yes		Yes	50	
Burns Bridge			Yes			50	Day Visitor Area
Bains Bridge			Yes			50	Day Visitor Area
Holylands					Yes	50	Bush Camping
Upper Jamieson Hut		Yes			Yes	50	
Low Saddle					Yes	50	Bush Camping
Tomahawk Hut					Yes	50	Bush Camping

Walking Track	Length (km)	Class*	Signs	Track Notes	Camping	SPZ Buffer	Comments
Plain Creek	2.5	Easy	Yes			50	
Craig Hut	2	Mod	Yes			50	
Bindaree Falls	0.5	Mod	Yes			50	
Mitchell's Bridle Track	24	Mod				50	Historic feature – Silver mine
Howqua Bridle Track	15	Mod				50	Also known as Howqua Feeder Track
Timbertop	1.2	Steep	Yes			50	
Australian Alps Walking Track (Mt Sunday to Mt McDonald)	5	Mod/Hard	Yes	Yes		50	Maintain in co-operation with Parks Victoria

continued next page

North East FMA *Management of recreation sites and walking tracks continued*

Beechworth Area							
Recreation Site	**Toilets**	**Fire places**	**Picnic Tables**	**Inform-ation**	**Camping**	**SPZ Buffer**	**Comments**
Murmungee Lookout		Yes	Yes			20	Hang glider launch site. Day Visitor Area
Bates Dam		Yes	Yes			20	Day Visitor Area
Clarkes Corner		Yes	Yes	Yes		20	Day Visitor Area. Construct information shelter
Yackandandah Creek		Yes	Yes	Yes	Yes	SPZ owl	Completion and upgrade of campsites
Forest Drive	**Toilets**	**Fire-places**	**Picnic Tables**	**Inform-ation**	**Camping**	**SPZ Buffer**	**Comments**
Beechworth Forest Drive:		en route	en route	brochure		SMZ land-scape	Includes Clarkes Corner, Murmungee Lookout and Bates Dam en route
Yackandandah Forest Drive		en route	en route	brochure	Yes	Within SPZ	Includes Yackandandah Creek en route
Bright Area							
Recreation Site	**Toilets**	**Fire-places**	**Picnic Tables**	**Inform-ation**	**Camping**	**SPZ Buffer**	**Comments**
Buckland Valley	Yes	Yes		Yes	Yes	100 m length of river	Improve 2WD access to camping area. Install info board and fire pits, update leaflet
Bakers Gully Reservoirs		Yes	Yes	Yes		20	Upgrade walking tracks
Bright Memorial Arboretum						50	Day Visitor Area. Install information board. Maintain trees and grounds. Replant failed trees
Mt Emu (Eskdale Spur)						100	Hang glider launching site and helipad
Mt Porepunkah						Scenic Reserve	Fire Lookout Tower and hang glider launching site
Snowy Creek (Dungeys Track)		Yes			Yes	50	Day Visitor Area
Walking Track	**Length (km)**	**Class***	**Signs**	**Track Notes**	**Camping**	**SPZ Buffer**	**Comments**
Apex Lookout	1.5	Mod		Yes		50	Install signs
Valley View	1	Mod		Yes		50	Install signs
Huggins Lookout	0.7	Mod		Yes		50	Install signs
Bakers Gully	2	Easy		Yes		50	
East Kiewa Pack Track	3	Easy	Yes			50	Historic pack horse track
Bright Memorial Arboretum	0.2	Easy				50	
Pioneer Mine							Proposed self-guided walk

continued next page

North East FMA *Management of recreation sites and walking tracks continued*

King Valley Area

Recreation Site	Toilets	Fire-places	Picnic Tables	Inform-ation	Camping	SPZ Buffer	Comments
Yackandandah Creek		Yes				50	
15 Mile Creek		Yes	Yes		Yes	50	Upgrade facilities
Boggy Creek						50	Bush Camping
Cheshunt Right Arm						50	Bush Camping
Meadow Creek			Yes	Yes		50	
Carboor Range North						20	Bush Camping
Evans Creek					Yes	20	Investigate need for day visitor facilities

Corryong Area

Recreation Site	Toilets	Fire-places	Picnic Tables	Inform-ation	Camping	SPZ Buffer	Comments
Wheeler Creek Hut	Yes	Yes	Yes		Yes	20	Within 200 m SPZ frog
Dunstan Logging Huts						20	Day Visitor Area
Gibson Hut					Yes	20	
Ski Hut						50	
Bunroy				Yes			Day Visitor Area
Little Bunroy Ck Camp					Yes	50	
Surveyors Creek Camp					Yes	50	
Gray's Track Camp					Yes	50	
Paddy Joy's Camp					Yes	50	
Barlows Creek	Yes					50	White water raft assembly point. Barlows Creek
O'Hagans Camp		Yes	Yes		Yes	50	
Bullocky Crossing		Yes			Yes	50	
Mt Elliot							Hang gliding ramp
Sassafras township site						50	Historic
Cattlemans Creek		Yes	Yes		Yes	50	
Dart River			Yes			50	

Myrtleford Area

Recreation Site	Toilets	Fire-places	Picnic Tables	Inform-ation	Camping	SPZ Buffer	Comments
Buffalo River. (Includes Blades, Tea Tree, Manna Gum, Abbeyard and Cobbler Lake Junction)		Yes	Yes	Yes	Yes	100 m along length of river	Non-designated camping along river. Upgrade picnic facilities. Bush Camping
Humffray River & Riley Creek Area					Yes	200 LCC NFZ	Bush Camping
Dandongadale River					Yes	50 SMZ	Bush Camping Popular 4WD, fishing, hunting, campers
Catherine River					Yes		Bush Camping, walkers only

Walking Track	Length (km)	Class*	Signs	Track Notes	Camping	SPZ Buffer	Comments
Reform Hill Walking Track	2	Mod	Yes			Entire State forest area of Reform Hill	Mining history and Hume and Hovell monument. Upgrade tracks and signs, and improve visitor safety at mine entrances. Encourage assistance from local groups

North East FMA *Management of recreation sites and walking tracks continued*

Tallangatta Area							
Recreation Site	**Toilets**	**Fire-place**	**Picnic Tables**	**Inform-ation**	**Camping**	**SPZ Buffer**	**Comments**
Mitta Mitta Historic Reserve	Yes		Yes			50	Water wheel, Dredge, Pioneer cottage. Day Visitor Area
Mitta Mitta Town				Yes		0	Information board near general store
Lightning Creek Picnic Area	Yes	Yes	Yes	Proposed.	Yes	Within SPZ frog	Historic Site. Interpretation proposed
Snowy Creek Picnic Area	Yes	Yes	Yes		Yes	50	Popular camping and fishing. Improve access and upgrade camp sites
Little Snowy Creek					Yes	50	Bush Camping
The Walnuts	Yes				Yes	20	Camping area is State forest and private property. The proposed sale of the private property may necessitate closure
The Hollow		Yes			Yes	50	Walk to Mt Bogong via Granite Flat Spur
The Mill		Yes	Yes			50	Beside Mitta Mitta River near former sawmill site. Connects with River Walk
Walking Track	**Length (km)**	**Class***	**Signs**	**Track Notes**	**Camping**	**SPZ Buffer**	**Comments**
River Walk	2.8	Easy-Mod	Yes	Yes		50	Improve access signage and interpretation
Deep Gully Walk	2.2	Mod	Yes	Yes		50	As above
Pioneer Mine	1.5	Easy-Mod	Yes			50	As above
Water Race Track and Mt Welcome Track	7.0	Easy (Water Race Tk), Hard (Mt Welcome Tk)	Yes	Proposed		50	Lookout at Mt Welcome
Australian Alps Walking Track, Long Spur (ANP boundary to Mt Wills Historic Area)	8.6	Mod	Yes	Yes		50	This section is maintained by Parks Victoria.

APPENDIX T

PRIORITY WORKS RELATING TO RECREATION AND TOURISM

District	Locality	Priority Works
Beechworth	Stanley State forest	Upgrade Beechworth Forest Drive Complete upgrading of Yackandandah Creek campsite facilities
Bright	Bright Memorial Arboretum	Renewal planting of failed trees in conjunction with a Friends group
	Bakers Gully	Improve sub-standard sections of track by use of boardwalks, ramps and improved drainage. Improve signposting, car park, woody weed control
	Buckland valley	Install information shelter, signage and permanent fire pits at main camp sites. Expand program of blackberry and broom control near campsites
	Pioneer Mine	Construct safety fences and other structures to improve visitor safety, and walking tracks. Develop interpretive literature for self-guided walk, in conjunction with local tourism organisations
	Upper Ovens	Maintain walking tracks
Myrtleford	Reform Hill[1]	Additional tree planting, upgrade tracks, signage and picnic facilities, improve safety structures at mine entrances, encourage care of monument by schools and service clubs
	Buffalo River	Maintain picnic facilities
Benalla	Toombullup Ranges	Investigate and if appropriate, plan development of facilities for day visitors based around historic sawmill township site, Kelly Tree etc. Improve signage and interpretation
Mansfield	various	Investigate development of additional horse camps
	Evans Creek	Investigate need for day visitor facilities
	Wrens Flat	Upgrade facilities
Corryong	various	Investigate development of information relating to an historic mining theme. Maintain huts and access
Mitta Mitta	Omeo Highway, Mitta Mitta to Glen Valley	Develop information supporting a two-wheel-drive vehicle tourist drive with historic mining theme. Co-operate with Parks Victoria to link with interpretation of Sunnyside, Glen Wills and Mt Wills Historic Area
	Snowy Creek	Improve access to campsites
	Mitta Mitta	Improve access, signage and interpretation of Pioneer Mine[2] viewing point, River Walk, Deep Gully Walk and Water Race Track
Moyhu/Whitfield	various	Maintain Boggy Creek, Fifteen Mile Creek, Cheshunt Right Arm, Carboor Range western (Meadow Creek) and northern end facilities
Tallangatta	Mt Bogong	Promote the Granite Flat Spur approach to Mt Bogong from The Hollow. Maintain access appropriate to the level of use
	Mt Brutle	Promote tin mining history, through preparation of information and maintain access
	Sandy Creek	Promote gold mining history, through preparation of information and maintain access
Tallangatta/Corryong	Gibb Range	Prepare pamphlet promoting Cravensville and Gibb Range Roads as a 4WD tour in Upper Murray area, including stops at Avondale Gardens and Dumbrell historic sawmill sites

Notes

1. N9 Historic Reserve is managed by NRE as part of Reform Hill, by arrangement with Parks Victoria
2. Pioneer mine is managed by Parks Victoria; the surrounds are State forest.

APPENDIX U

HISTORIC VALUE AND MANAGEMENT OF HUTS IN THE NORTH EAST

North East FMA

Hut Name	Historic Value	Heritage Status	Refuge Value	Maintain by	Management Action
Bright Area					
Selwyn Hut	L		C	Albury/ Wodonga 4WD Club	Maintain
Blair's-Simmonds Gap Hut	R		E	Licensee	Retain. 50 m buffer. Discuss with licensee the use of volunteers to assist with maintenance. Repair according to Historic Places guidelines. Exclude vehicles
Guy's Hut	U		C	NRE	Retain while Historic Places Section (HPS) assesses historic significance. Retain if historic and seek volunteer group to assist in maintenance
Spring Saddle Hut	R		D		Retain. Parks Victoria to manage
Corryong Area					
Wheelers Creek Hut	L		C	NRE	Maintain, 50 m buffer
Gibson Old Hut	L	RNE-n	E		Protect Historic Fabric. 20 m buffer
Wilson Logging Hut	L		E		Remove
Surveyor's Creek Hut	N		E		Remove
Dunstan Logging Huts	R		D	NRE	Maintain, 15 m buffer
Upper Murray Ski Club Hut (Lind Lodge)	R	RNE-n	C	NRE	Maintain, 50 m buffer
Flying Swagman's Hut	L		E		Protect historic fabric. 20 m buffer
Pinnibar (Gibson) Hut	L		C	NRE	Maintain. 20 m buffer
Myrtleford Area					
Dandongadale Hut	L		C	NRE	Retain
Riley Hut	U		C	NRE (Volunteers)	Maintain, HPS to assess historic significance. Use volunteer groups on task (not on-going) basis
Yackandandah Area					
Underground Hut	**N**		**E**	**NRE (Volunteers)**	Maintain using various volunteer groups
Tallangatta Area					
CRB Hut (Old Logging Camp)	L		D		Protect historic fabric. 20 m buffer
Hodgkin Hut	L		E		Protect historic fabric. 20 m buffer
Huts (Rogers Creek, 2 huts)	L		D		Protect historic fabric. 20 m buffer
Mulhauser Mine Hut	L		B	NRE	Retain
Hut (Trappers Gap)	N		D	Wodonga Rotary Club	Maintain

continued next page

Benalla–Mansfield FMA *Historic value and management of huts continued*

Hut Name	Historic Value	Heritage Status	Refuge Value	Maintain by	Management Action
Evans Creek Hut	L		D	NRE	Maintain. 20 m buffer
Ivan Carlson Logging Hut	L		B	NRE (Volunteers)	Maintain. Seek volunteers to assist with maintenance
Wrens Flat Hut	U		C	NRE (Volunteers)	Maintain for HPS to assess historic significance. Seek volunteers to assist with maintenance
Tomahawk Hut	R	RNE-n	B	NRE (Volunteers)	Maintain, 20 m buffer
Upper Jamieson Hut	R	RNE-n	B	NRE (Volunteers)	Maintain historic fabric, restrict vehicular access, re-roof with second hand corrugated iron, traditional flashings and fixings, 50m buffer
Razorback Hut (Purcell Hut)	U		B	NRE	Maintain hut for public use. Review location and management of horse yards to address environmental concerns, in consultation with Mt Stirling Alpine Resort Management Board
Mount Number 3 Hut	U		B	Mansfield XC Ski Club	Volunteers will continue to maintain the hut
Craig Hut	N		C	Mansfield 4WD Club	Volunteers will continue to maintain the hut. Maintain vehicle access to four-wheel drive standard. Discourage car-based camping. Monitor use to minimise environmental impacts. Exclusive use of the area is not permitted. Helicopter landings at the site without prior NRE approval will be discouraged. 200 m buffer. Review guidelines in consultation with Mansfield 4WD Club and Mt Stirling Alpine Resort Management Board

Historic Value
S = State I = Of Interest
R = Regional N = No Significance
L = Local U = Unclassified

Refuge Value
A = Very High C = Moderate
B = High D = Low
E = Nil

Heritage Value
RNE-n = nominated to the Register of National Estate

APPENDIX V

MANAGEMENT OF HISTORIC PLACES WITHIN THE NORTH EAST

Significance, management objectives and buffer sizes of historic places within the North East

HPS No.	Area No.	Site	Management	Buffer (radius-SPZ)	Significance
		Agememnon Claim	Landscape	50 m	Regional
2421	126	Alabama Mine	Protect historic fabric		Not assessed
	1224	Barambogie Railway Reservoir and Chiltern Town Water Supply	Protect historic fabric		Local
		Battery, Hopeful Saddle		30 m	Local
	264	Battery, Lightning Creek		20 m	Not assessed
	286	Battery, Dean Creek	Protect historic fabric		Local
2422	119	Battery Site, Near Ten Mile	Protect historic fabric		Not assessed
	207	Battery Site, Whitfield	Protect historic fabric		Not assessed
	279	Bell's Sawmill Site		50 m	Local
2946		Beveridge's Station	Protect historic fabric		Local
	947	Big Hill Bench No.5 and Aqueduct		50 m No. 5 Bench, 20 m either side of aqueduct	RNE-n, Regional
	324	Birthday Reef Workings	Protect historic fabric		Local
	226	Blair's Hut (Simmonds Gap)	Proposed repairs to be in accordance with Historic Places Section guidelines	50 m	Regional
2429	109	Blocks Mine	Protect historic fabric		Local
2433	107	Blue Ribbon Mine	Protect historic fabric		Local
	321	Bogong Saddle Battery	Protect historic fabric		Local
2958	116	Bowonga Tin Field	Protect historic fabric		Local
	N6029	Bright Memorial Arboretum	Protect historic fabric		Local
2442	147	Britannia Mine	Protect historic fabric		Local
	318	Buckeye Mine and Battery Site		20 m	Regional
	315	Buckland River Alluvial Workings		100 m	Regional
	317	Buckland River Hydraulic. Gold Sluicing Paddock		150 m	VHR, State
	525	Buckland River Riot Sites	Protect historic fabric		Local
2947	146	Buckland Township Site	Protect historic fabric		Local
2417	143	Caledonia Mine	Landscape		Regional
	1024	Carmody's Hut and Yards ruin		20 m	Local
	309	Centenary Battery Site		50 m	RNE-r, Regional
	308	Champion Battery		50 m	Regional
2469	132	Cinnibar Mine (Quicksilver Mine)	Protect historic fabric		Regional
2426	131	Clancy Mine	Protect historic fabric		Local
	N6042	Clarkes Corner Camp	Protect historic fabric		Local
2837	130	Clear Hills Hut Site	Protect historic fabric		Local
	314	Cockers Sluice Hole	Protect historic fabric		Regional
		CRB Hut, Mt Wills		20 m	Local
2937	643	Crescent Mine	Protect historic fabric		Local
	346	Cribbage Creek Alluvial Gold Workings	Landscape	50 m either side of Sassafras Creek	Regional
	344	Crystal Mine		50 m	Local
	220	Dandongadale Hut	Protect historic fabric		Not assessed
		Dart River Battery		100 m	RNE-i, State
	N5007	Delatite Sawmilling Company Pty Ltd Mill		50 m	Regional
		Dingo Fence (Sandy Creek)	Protect historic fabric		Local
		Dry Creek Alluvial Workings	Landscape		Regional

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Management of historic places within the North East continued

HPS No.	Area No.	Site	Management	Buffer (radius-SPZ)	Significance
	N5118	Dumbrells Mills and Timber Tramway	100 m radius around mill sites 560E815N, 577E737N and 578E705N; 50 m radius around lowering gear site 573E711N, tramway repairers hut site 558E812N and two timber dumps 558E847N; and 20 m either side of the tramway formation		RNE-n, Regional
	945	Dungey Track		20 m	RNE-n, Regional
	N5024	Dunstan Logging Huts		15 m	Regional
2450		Elsie May Mine	Protect historic fabric		Local
	N5021	Emberys Sawmill		50 m	Local
		Enevers Claim		50 m	Regional
2440		Enterprise Mine	Protect historic fabric		Local
		Eucalypt Species Trial Plot		40 m	Local
		Extensive Mining Area, Mt Lockhart	Protect historic fabric		Local
		Extensive Mining Area, Mt Lockhart	Protect historic fabric		Local
		Firebrace Reef Workings	Protect historic fabric		Local
		Ganders Reef Mine Site		100 m	RNE-r, Regional
		Gibb Sawmill Site	Protect historic fabric		Local
	784	Gibson's Old Hut (ruin)		20 m	RNE-n, Local
		Gold Diggings, Toombullup	Protect historic fabric		Of interest
1121		Golden Treasure Battery	Protect tramway	20 m	Regional
2327		Goldie Spur Track			Of interest
		Grand Junction Gold Sluicing claim	Landscape. SPZ encompassing Pioneer and Union Gold Sluicing Claim, Pride of Mitta Mitta Claim, Mammoth Sluicing Claim and Long Point Sluicing Claim	50 m	Regional
		Grasshopper Battery Site		50 m	Regional
		Grave Site, Toombullup		15 m	Local
1118		Grave Site, Corryong		15 m	Local
		Grave Site, Germantown	Protect historic fabric	15 m	Not assessed.
		Grave Site, Freeburgh	Protect historic fabric	15 m	Not assessed.
		Growlers Creek Dredge		100 m	RNE-r, VHR, State.
		Gunislake Mining Settlement	Discourage visitation	100 m	Regional.
		Gun Creek Battery Sites	100 m around 5910000:503500 and 5909200:502600		RNE-r, State
		Guy Hut (Mt Sarah)	Protect historic fabric		Not assessed
		Hodgkin Hut		20 m	Local
2453		Home Rule Mine	Protect historic fabric		Not assessed
		Homestead Site, Elmo	Protect historic fabric		Local
		Homestead Site, Lucyvale	Protect historic fabric		Regional
		Hopeful Battery		20 m	Regional
		Howes Sawmill Site No. 1		50 m	Local
		Howes Sawmill Site No. 2		50 m	Local
2430		Hungarian Mine	Protect historic fabric		Local
		Hut, Mt Elliot.		20 m	Local
2467		Hut (ruin) Jamieson–Licola Road. Snake Edwards Divide	Protect historic fabric		Local
		Hut site, Lord Creek	Protect historic fabric		Not assessed
		Hut (Surveyors Creek)			Not significant
		Hydraulic Elevator and Sluicing Tray	Implement conservation management plan	250 m	VHR, State
		Ivan Carlson Logging Hut	Protect historic fabric		Local
7		Jamieson Alluvial Workings	Landscape		Regional

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Management of historic places within the North East continued

HPS No.	Area No.	Site	Management	Buffer (radius-SPZ)	Significance
	N6008	Jamieson Camp			Not significant
		Junction Mining Village, Growlers Creek	Protect historic fabric		Regional
		Just in Time Mine	Protect historic fabric		Local
2413		Kennys Star Mine	Protect historic fabric		Local
2436		Lady Elizabeth Mine	Protect historic fabric		Local
		Lady Jane Battery		20 m	Local
1119		Lady Loch Mine		50 m	Regional
		Leviathan (Hungfee) Battery Site		50 m	Regional
1429		Liffey (Gribbles) Battery		50 m	State
		Lightning Creek Diggings		20 m	Local
		Lightning Creek Diggings		20 m	Local
	RFA: T1/12	Lightning Creek Flume and Dunstans Log Dump site	Protect historic fabric		Local
		Logging Hut (Evans Creek)		20 m	Local
	N5005	Logging Hut (Trappers Gap)			Not significant
		London and Myrtle Battery		20 m	Local
		Long Point Gold Sluicing. Claim	Landscape. SPZ encompassing Pioneer and Union Gold Sluicing Claim, Pride of Mitta Mitta Claim, Mammoth Sluicing Claim and Grand Junction Sluicing Claim		Regional
2437		Loyola Mine	Protect historic fabric		Not assessed
	N5019	Lucky Hit Sawmill.		20 m	Local
2414		Lyre Bird Mine	Protect historic fabric		Local.
		Mammoth Gold Sluicing Claim	Landscape		Regional
		Markham Reef Gold Workings		50 m	Regional
	N5012	McCashney & Harper sawmill & Baker Creek log tramway, Buttercup	Discourage visitation	50 m around mill, 20 m each side of tramway	Regional
	N5034	McCashney and Harpers. Toombullup Sawmills and Tramway	200 m around Toombullup mill 302E192N, 100 m around Kelly Creek mill 273E202N, 100 m around Watchbox mill 271E291N, 20 m each side of tramway from Toombullup mill to Tiger Hill 230E339N along Ryans Creek		RNE-n, Regional
2468		Jamieson–Licola Road	Protect historic fabric		Local
2405		Mine, Razorback Spur	Protect historic fabric		Local
		Mine, Cheshunt	Protect historic fabric		Local
		Mine, Cheshunt	Protect historic fabric		Local
		Mine, Cheshunt	Protect historic fabric		Local
		Mine, Cheshunt	Protect historic fabric		Local
		Mine, Elmo		40 m	Local
		Mine, Mt Dorchap		40 m	Local
		Mine, Granite Peak		30 m	Local
		Mine, Lightning Creek		20 m	Local
		Mine, Hopeful Saddle		30 m	Local
		Mine, Lightning Creek		20 m	Local
		Mine, Dean Creek		20 m	Local
		Mine, Dean Creek		20 m	Local
2959		Mine, Mitta Mitta	Protect historic fabric		Local
		Mining Dam, Gapstead	Protect historic fabric		Local
		Mirimbah Forest Camp	Protect historic fabric		Local
		Mount Merrimac Battery		50 m	State
2438		Mountain View Mine	Protect historic fabric		Local

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Management of historic places within the North East continued

HPS No.	Area No.	Site	Management	Buffer (radius-SPZ)	Significance
		Mt Pinnibar (Gibsons) Hut		20 m	Local
		Mulhauser Mine Hut	Protect historic fabric		Local
		Mulhauser No. 1	Protect historic fabric		Local
2439		Murphys Mine	Protect historic fabric		Local
	N5025	Myrrhee Logging Winch	Protect historic fabric		Local
2452		Nimrod Mine	Protect historic fabric		Local
2418		Northern Star Mine	Protect historic fabric		Local
2427		Nugget Mine	Protect historic fabric		Local
2416		O'Neil Mine	Protect historic fabric		Local
		Old Kevington	Protect historic fabric		Of Interest
		Oriental Reef Gold Workings	Landscape/ Protect historic fabric		Regional
		Orton Track Battery		20 m	Local
2443		Persses Mine	Protect historic fabric		Local
		Phoenix Battery Site		20 m	Regional
		Pioneer and Union Gold. Sluicing Claim	Landscape. SPZ encompassing Pride of Mitta Mitta Claim, Mammoth Sluicing Claim, Grand Junction Claim and Long Point Sluicing Claim	Landscape SPZ	RNE-r, VHR, State
		Pioneer Mine, Bright	Protect historic fabric. Develop for public interpretation	50 m SMZ	
		Plain Creek Trestle Bridge		20 m	Local
		Plane Crash Site	Protect monument		Local
		Pride of Mitta Mitta Gold. Sluicing claim	Landscape. SPZ encompassing Pioneer and Union Gold Sluicing Claim, Grand Junction Claim, Mammoth Sluicing Claim and Long Point Sluicing Claim		Regional
		Razorback (Purcell) Hut.	Protect historic fabric		Not assessed
		Reform Hill Mine	Protect historic fabric		Local
		Riley Hut	Protect historic fabric		Not assessed
		Road Construction Camp Site	Protect historic fabric		Not assessed
	N5001	Rogers Creek Logging Huts		20 m	Local
		Rose Thistle and Shamrock Mines	Protect historic fabric Does not exclude timber harvesting and, weed and vermin control but permit required	500 m around E003 N181 (Same as Registration on VHR)	RNE-r, VHR, State
2451		Rubicon Mine	Protect historic fabric		Local
2935		Sambas Mine		50 m	Regional
		Sassafras & Saltpetre Creek. Alluvial Gold Workings	Landscape		Regional
		Saxey Creek Hut site		30 m	Local
		Saxey Creek Mine		20 m	Local
2435		Schwertzberger Mine	Protect historic fabric		Local
		Selwyn Hut	Protect historic fabric		Local
		Settlement Site	Protect historic fabric		Not assessed
2432		Shaw and Marron Mine	Protect historic fabric		Local
2411		Slate Mine	Protect historic fabric		Local
	N5032	Sloans Sawmill	Remove tree to protect dry-stone wall. Encourage further investigation of location of water-powered mill	100 m	RNE-n, Regional

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Management of historic places within the North East continued

HPS No.	Area No.	Site	Management	Buffer (radius-SPZ)	Significance
	N5032	Sluice Mining		40 m	Local
2431		Specimen Mine	Protect historic fabric		Not assessed
2428		Star Mine	Protect historic fabric		Local
		Star of Erin Gold Mine	Landscape	50 m	Regional
2420		Star of the West Mine	Protect historic fabric		Local
		Stockyard Creek Diversion. Sluice	Linear feature	50 m either side of 250 m sluice	RNE-r, VHR, State
		Ten Mile Alluvial Workings	Landscape		Local
		Thowgla Creek Alluvial Gold Workings	Landscape	50 m either side of Bullocky Creek	Regional
		Tin Mine		40 m	Local
2899	712	Tomahawk Hut		20 m	RNE-n, Regional
		Tunnel Bend Diversion Tunnel	Protect historic fabric		State
2441		Tyro Mine	Protect historic fabric		Local
167		United Gleasons Battery Site		50 m	State
168		United Gleasons Mine		50 m	State
2858	592	Upper Jamieson Hut		50 m	RNE-n, Regional
	967	Upper Murray Ski Club Hut (Lind Lodge)		50 m	RNE-n, Regional
		Wells' Murmungee Battery[1]	Stabilise waterwheel. Prepare conservation management plan	100 m	RNE, VHR, State
2434		Wheeler Mine	Protect historic fabric		Local
		Wheelers Creek Hut		30 m	Local
1117		Wild Boar Mine & Battery		50 m	RNE-i, State
		Williams United Mine		20 m	Regional
157		Working Miners Mine	Protect historic fabric		Local
		Yackandandah Creek. Hydraulic Gold Sluicing Pit		200 m	RNE-r, VHR, State
1129		Zulu Township Site	Protect historic fabric		Local
		Belleville, adits	Protect historic fabric		Regional
		Blue Bell, adits, mullock heaps, shaft	Protect historic fabric		Regional
		Bon Accord (two shafts)	Protect historic fabric		Local
		Butler, adits	Protect historic fabric		Regional
		Cameron, adits, mullock heaps, open cut	Protect historic fabric		Regional
		Christmas Gift, adits, battery and portable engine, foundations		100 m	Regional
		Dagworth, adits	Protect historic fabric		Regional
		Dublin, battery site, stone foundations, surface workings, mullock heaps		50 m	Regional
		English and Welsh, adits, shafts, Artefacts	Protect historic fabric		Regional
		Evening Star, adits, stopes, Costeans	Protect historic fabric		Regional
		Exhibition, adits, artefacts, stone foundations		100 m	Regional
		Friday, building remains, trenches, workings		50 m	Regional
		Gorilla, adits, artefacts	Protect historic fabric		Regional

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1. Historic site managed by Parks Victoria, surrounded by State forest

Management of historic places within the North East continued

Homeward Bound, Rocky Point Boiler, building foundations, reef workings		100 m	Regional
Homeward Bound, mullock heaps, shafts, adits Smoko	Protect historic fabric		Regional
Homeward Bound/Von Molke, open cut, shed, adits, battery foundations, Hillsborough		50 m	Regional
Hope, mullock heap, adit	Protect historic fabric		Regional
Juvenile/Home Rule, surface workings, adits, winze, windlass remains at winze	Protect historic fabric		Regional
Kingsborough, adits, shafts, water race	Protect historic fabric		Regional
London Tramway, adits, mullock heaps, artefacts, machinery	Protect historic fabric		Regional
Lone Hand/Coxons, mullock heaps, shafts, adits	Protect historic fabric		Regional
Mazona, surface workings	Protect historic fabric		Regional
Miners Right, battery sites, reef workings	Protect historic fabric		Regional
Mongrel, steam engine, adits, mullock heaps		100 m	Regional
Native Youth, reef workings	Protect historic fabric		Regional
No Name, adit, dry stone walls, building foundations	Protect historic fabric		Regional
Noahs Ark, adits, artefacts	Protect historic fabric		Regional
Raes Battery, stone walls and chimney base, pits, water races		50 m	Regional
Red Jacket, adits, shafts and stopes	Protect historic fabric		Regional
Richardson, battery site, building foundations, reef workings		100 m	Regional
Salisbury, adits and winze	Protect historic fabric		Regional
Star of the East, shafts, adits, mullock heaps	Protect historic fabric		Regional
Try Again, adits, building foundations	Protect historic fabric		Regional
Two Teds, adits and stopes	Protect historic fabric		Regional
Union Jack, domed oven, adits		30 m	Regional
Unity, adits and winze, mullock heaps	Protect historic fabric		Regional
Unknown, minor surface workings, Mt Porepunkah	Protect historic fabric		Local
Unknown, adits, stone building foundations	Protect historic fabric		Regional
Waterloo, adits, shafts, artefacts	Protect historic fabric		Regional
Tolmie to Buckland Junction gold mine trail no. 216, constructed 1897	Protect historic fabric		Regional

Definitions:

Historic places that occur on State forest and are selected from the NRE's Historic Places Section database and places identified as containing historic and cultural values of National Estate value

Buffer:

SPZ (m): No timber harvesting or machine movement within specified number of metres from the site

Management:

20 m no machine movement: No machine movement within 20 m of the site

Protect historic fabric: Any historic artefact should be left *in situ*

Significance:

RNE: Sites listed on the Register of National Estate

RNE-i: Site registered on the interim list for the Register of National Estate

RNE-n: Sites that have been nominated to the Register of National Estate

RNE-r: Sites ranked as having National Estate values

VHR: Sites listed on the Victorian Heritage Register

APPENDIX W

MANAGEMENT OF AESTHETIC VALUES AND AREAS OF HIGH SCENIC QUALITY IN STATE FOREST

Place	Significance	Zone/Management
Benalla/Mansfield		
Sandy Creek Waterfall (Strathbogie Ranges)	Unique Water Feature	100 m SPZ around falls
Bindaree Falls	Unique Water Feature	100 m SPZ around falls
Carters Road Picnic Area	High scenic values in recreation area	50 m SMZ around picnic area
Plain Creek Tramway (Sawmill Settlement)	Historic site of local significance	20 m buffer around historic trestle bridge
Craig Hut	Scenic location	200 m SPZ around hut
Goulburn River (Knockwood to Jamieson)	LCC 1991 Victorian Heritage River A5	200 m SPZ each side of stream (incorporates 200 m LCC Streamside Conservation Natural Features Zone from Knockwood to Stony Creek)
Howqua River (Tobacco Flat to Running Creek)	LCC 1991 Victorian Heritage River A3	200 m SPZ each side of stream
Lower Howqua North/Red Hill	Indicative Natural Landscape (National Estate)	Coupe design to minimise impact on view from Mt Buller
Jamieson River (above Grannies Flat)	Visual corridor and natural water feature	200 m SPZ each side of stream. Existing roads and recreation facilities to remain
Mt Skene	LCC Natural Features and Scenic Reserve	Managed by Parks Victoria, surrounded by State forest. Manage according to LCC recommendations
Upper Delatite valley (vicinity of Mirimbah)	LCC recommendation	200 m SPZ each side of river (incorporates 200 m LCC Streamside Conservation Natural Features Zone)
15 Mile Creek	Visual corridor and natural water feature	50 m SMZ either side of creek
Holland Creek (part)	Visual corridor and natural water feature	50 m SMZ either side of creek
Moonee Range (Strathbogie Ranges)	Mountain view from Midland Highway	SMZ
Lightning Ridge (Strathbogie Ranges)	Mountain views from Lake Nillahcootie and Midland Highway	SMZ and SPZ will adequately protect this area
Australian Alps Walking Track (Mt Skene to Mt McDonald) Mt View (Snake-Edwards Divide)	LCC recommendation Indicative Natural Landscape (National Estate)	LCC Natural Features and Scenic Reserve from south of Mt Skene to Mt Sunday. LCC 50 m SPZ each side of Australian Alps Walking Track Coupe design to minimise impact on view from Mt Skene Road
Bright		
Big Hill/The Springs Saddle/Bald Hill/Bogong Jack Saddle	Mountain views from Mt Beauty township and Mt Fainter North	SMZ
Clear Creek (Tributary of Buckland River)	Visual corridor and natural water feature	50 m SMZ each side of stream
Pheasant Creek (Tributary of Buckland River)	Visual corridor and natural water feature	50 m SMZ each side of stream
Upper Wongungarra River Catchment	LCC recommendation	200 m LCC Streamside Conservation Natural Features Zone on Selwyn Ck
Buffalo River upstream of Dandongadale	LCC recommendation	200 m SPZ; LCC Streamside conservation Natural Features Zone upstream of Catherine Station on east and west branches. 50 m SMZ buffer each side of the remainder of the river
Dandongadale River	Visual corridor and natural water feature	50 m SMZ each side of river

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Management of aesthetic values and areas of high scenic quality continued

Place	Significance	Zone/Management
Bright (continued)		
Yarrabulla Creek	Visual corridor and natural water feature	50 m SMZ each side of stream. Partly within Remote & Natural Area
Trappers Creek (near Mountain Creek)	Visual corridor and natural water feature	50 m SMZ each side of stream
Buckland Valley	NTA(V) recorded, LCC recommendation	LCC Natural Features Zone at Beveridge Station, from Dingo Ck to Buckland River East Branch. 50 m SPZ each side of stream.
Harrietville Valley (vicinity of Harrietville) and Ovens River, West Branch	NTA(V) recorded, Visual corridor and natural water feature, LCC recommendation	20 m SMZ each side of the Great Alpine Road. 200 m LCC Streamside Conservation Natural Features Zone on Ovens River West Branch downstream of Gunns Creek
Mt Porepunkah view	NTA(V) classified, LCC recommendation	LCC Scenic Reserve N4 (District 3, 4 & 5). Manage according to LCC recommendations
West Kiewa valley	Viewed from Mt Feathertop, indicative aesthetic National Estate	Designated Catchment, SPZ and SMZ
Wongungarra & Humffray Rivers & Teatree Range except ridge	Indicative Natural Landscape (National Estate)	National Park, SMZ, Mt Sarah Scenic Reserve
Beechworth		
Beechworth Forest Drive	Scenic corridor for tourist roads	50 m SMZ each side of road. Most of Stanley Plateau is SPZ
Murmungee Basin, Flagstaff Range (western aspect) from Lady Newton Drive to Taylors Gap	NTA(V) classified	SPZ provides protection
Myrtle (Barwidgee) Creek Valley (vicinity of Myrtleford)	NTA(V) classified, Visual corridor and natural water feature	50 m SPZ on State forest side of Stanley to Barwidgee Road
Yackandandah Creek (from Nine Mile Creek to State forest boundary)	Visual corridor and natural water feature	50 m SMZ either side of creek
Mt Murramurrangbong and Mt Big Ben	Indicative aesthetic value (National Estate)	Mt Murramurrangbong is SPZ and Mt Big Ben summit is SPZ. Coupe design.
Corryong		
Mt Pinnibar	Scenic mountain views	LCC Natural Features and Scenic Reserve
Nariel–Benambra Road	Scenic corridor for tourist road	50 m SMZ each side of road
Upper Nariel valley above Crawford Crossing	Visual corridor and natural water feature	50 m SMZ each side of stream (where in State forest)
Myrtleford		
Yarrabulla Creek	Visual corridor and natural water feature	50 m SMZ each side of stream. Partly within Remote & Natural Area
Buffalo River upstream of Dandongadale	LCC recommendation	200 m SPZ; LCC Streamside conservation Natural Features Zone upstream of Catherine Station on east and west branches. 50 m SMZ buffer each side of the remainder of the river
Dandongadale River	Visual corridor and natural water feature	50 m SMZ each side of river
The Pinnacles & Mt Jack including Barwidgee Creek	Indicative aesthetic value (National Estate)	Headwaters of Barwidgee Creek is SPZ, some additional SPZ, also coupe design in GMZ
Tallangatta		
Conic Range (partly State forest)	Ridge-line features	SPZ
Granite Peak	RNE Natural site. Mountain Views from Omeo Hwy	SMZ in State forest, above 1100 m elevation
Harkers Creek (Mitta Mitta)	Visual corridor and natural water feature	50 m SPZ each side of stream

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Management of aesthetic values and areas of high scenic quality continued

Place	Significance	Zone/Management
Mitta Mitta Valley (downstream of Mitta Mitta)	NTA(V) classified, Visual corridor and natural water feature	50 m SMZ each side of road where State forest
Mt Cravensville	Scenic location	Natural Features and Scenic Reserve (LCC Alpine Special 1983)
Snowy Creek Waterfall	Natural water feature	100 m SPZ around falls
Eskdale Spur & Mt Emu	Indicative aesthetic value (National Estate)	Coupe design to minimise impact on view from Kiewa Valley Highway
Mt Cudgewa / Rogers Creek	Indicative Natural Landscape (National Estate)	Coupe design to minimise impact on view from Henlow (Tallangatta Valley)
Mt Wills Historic Area[1]	Indicative National Estate values (natural, aesthetic) along Omeo Highway	Restriction on length of roadside recently harvested. Retain one or more viewing spots for Mt Kosciuszko. See 8.2 Landscape
Australian Alps Walking Track, Mt Wills	LCC recommendation	50 m SPZ each side of Australian Alps Walking Track

Definitions:

NTA (V) classified: Landscape classified by the National Trust of Australia (Victoria)

RNE Natural sites: Listed on the Register of National Estate

Note: Corryong area (Razorback Spur to Mt Pinnibar) LCC former Alpine Walking Track visual buffer of 50 m to be removed as Australian Alps Walking Track has been re-routed through Alpine National Park.

1. Historic area managed by Parks Victoria. Logging permitted in cetain defined areas, under conditions agreed between Parks Victroria and NRE

APPENDIX X

GRAZING LICENCE SPECIAL CONDITIONS AND EXCLUSION GUIDELINES FOR GRAZING IN STATE FOREST

Excerpt from the Grazing Licence issued under the Forests Act *1958*

SCHEDULE 1

14. Special Conditions:

14.1 No land comprised in roads from time to time surveyed and marked out within the boundaries of the licensed land shall be deemed to be subject to this licence.

14.2 Free access to water shall be kept open at all times for travelling and other stock and for persons wishing to take water for domestic purposes.

14.3 (i)The licensor may review the licensed area annually and may determine such areas from which grazing must be temporarily excluded. Areas in respect of which notification in writing of exclusion may be given, are areas:

(i) used for reforestation and regeneration
(ii) of flora and fauna significance
(iii) subject to rehabilitation works, or
(iv) designated as sites used for camping, recreation or education purposes at the time of issuing of the licence.

(ii)Areas from which stock must be temporarily excluded will be notified in writing at least 4 months prior to the anniversary of the date on which the licence was issued. Specific guidelines which identify conditions under which exclusions may occur are set out under Schedule 2.

14.4 The Licensor shall advise the licensee in writing at least four weeks prior to any planned fuel reduction burning to be undertaken within the licensed area.

14.5 The licensee shall permit only stock owned by the licensee to graze on the licensed area.

14.6 The licensee must notify the licensor, or his/her delegate, of the date on which stock will enter the area under licence and the date of muster of such stock for removal from the licence area. All stock at the time of release shall be adequately tagged or identifiable.

14.7 The number of stock including adults and calves that may be grazed on the licence area will be determined by the licensor after consultation with the licensee. The number may be reviewed annually subject to Clause 14.3 (i), up to an agreed maximum number for the licence area depending on seasonal conditions. No bulls (i.e. mature males) will be permitted to graze in the licence area.

14.8 In the event of the licensee being granted authority by the licensor or his agent to erect any building, fence, gate, ramp or other improvement on the licensed area, the licensee shall provide gates or slip panels for the convenience of the public when called upon to do so by the licensor or his agent. The licensee shall not be entitled to any compensation in respect of any building, fence, gate, ramp or other improvement erected on the licensed area.

SCHEDULE 2
INTERIM FOREST GRAZING LICENSING – GUIDELINES
EXCLUSION GUIDELINES

Areas of State forest over which grazing licences will generally not be issued:

- Areas of State forest identified for protection in the Special Protection Zone of an approved Forest Management Plan where the key flora or fauna conservation features of the zone have an approved Action Plan in which grazing has been identified as a threatening process.
- Land identified in an approved Forest Management Plan which is in a substantially degraded biological and physical condition requiring rehabilitation.
- Designated research plots where cattle grazing is incompatible with the specific objectives of the research project.
- Identified Historic sites where cattle grazing has been identified in an approved Historic Site Management Plan as having detrimental impact on the historic fabric of the site.
- Recreation zones in an approved Forest Management Plan where infrastructure is established and visitor use is high and concentrated.

TEMPORARY EXCLUSION DURING THE TERM OF A LICENCE MAY ONLY BE APPLIED TO:

- Designated sites which are subject to reforestation, revegetation, or soil rehabilitation works, especially erosion control works, e.g. land slips or road batter works.
- Timber harvesting areas where regeneration failure is directly attributable to cattle browsing or trampling and in which silvicultural re-treatment would be required to achieve acceptable regeneration stocking levels. (Exclusion of stock from the harvesting area would be required up to a maximum of three years from the time of re-treatment).
- Designated sites used for camping, recreation or education purposes to be identified at the time of issuing the licence.
- Designated Areas of State forest where a natural disaster such as wildfire or flood would preclude cattle grazing. Temporary exclusion should only occur following inspection of the affected area with the licensor.

Designated areas of State forest in which a new species of flora or fauna for that grazing area is discovered in small areas or numbers such as to indicate it may be threatened specifically by cattle browsing or tramping. Approved management plans or action plans may not be available for the species concerned. Where approved management plans or action plans have not been prepared, then temporary exclusion could only proceed with Executive Director, Forests Service, approval.

APPENDIX Y

ROAD AND TRACK CLOSURES IN STATE FOREST IN THE NORTH EAST

Road or Track Name	Closure Type	Reason for closure
Strathbogie Ranges State forest		
Moonie Moonie Creek Track	S	Protect track surface
Vinegar Hill Track	S	Protect track surface
Tallangalook Track	S	Protect track surface
Bamfords Track	Pr	Protection of Conservation or Reference Area
D8 Track	Pr	Protection of Conservation or Reference Area
Wards Track (Stowes Road to D2 Road)	PR	Protect water quality
Unnamed track (off Kangaroo Creek Track)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (parallel to Police Track, south of Mt Albert)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (east side of Dry Creek Road)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (north west of Mt Samaria State Park)	P	Obsolete, redundant, duplicated or unnecessary track
Toombullup Ranges State forest		
Ryans Creek Track	S	Protect water quality
Loombah Weir Track	S	Protect water quality
Triangle Road	S	Protect track surface. Protect water quality
Hancocks Track	S	Protect track surface
Whisky Creek Road (between VPC plantation and Webbs Road)	S	Protect water quality
Unnamed tracks (off Whisky Creek Road, near Dogwood Creek)	P	Protect water quality
Unnamed track ((two tracks), 3 km. south of Fifteen Mile Creek School Camp)	P	Obsolete, redundant, duplicated or unnecessary track
Mansfield area		
Macdonald's Spur Track	S	Protect track surface
Evans Creek Track	S	Protect track surface
Cambatong Spur Track (Bald Hills to Carters Rd)	S	Protect track surface
No.3 Road	S	Protect track surface
King Basin Road	S	Protect track surface
Bindaree Road	S	Protect track surface
Circuit Road (King Saddle to Howqua Gap)	S	Protect track surface. Non-vehicle snow recreation
Monument Track (Southern end)	S	Protect track surface. Non-vehicle snow recreation
Speculation Road (Circuit Road to King River)	S	Protect track surface
Corn Hill Logging Road	S	Protect track surface. Protect water quality
Brocks Road (from 2km south west of King Billy)	S	Protect track surface. Protect water quality
East Timbertop Logging Road	S	Protect track surface
Mitchells Creek Track (Slate Mine to Wrens Flat)	S	Protect track surface
Handford Creek Logging Road	S	Protect track surface
Cairn Creek Track	S	Protect track surface
Buckland Spur Track	S	Protect track surface
Nobs Track	S	Protect track surface
Mt Clear Track	Pr	Obsolete, redundant, duplicated or unnecessary track (Conform with Park closure, allow alpine grazing access).
Clear Creek Logging Road	R	Obsolete, redundant, duplicated or unnecessary track
Refrigerator Gap Track	S	Protect track surface
Unnamed track (Loyola Gully)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (linking Three Chain Rd to Ware Flat)	P	Protect water quality. Safety of users
Unnamed dead end track (from Speculation Track towards The Pimple)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (link from Carters Road to Cambatong Track)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed dead end tracks (x3 running north from Mt Stirling Road between Mirimbah and Browns Creek)	P	Obsolete, redundant, duplicated or unnecessary track
King Hut Jeep Track	S	Protect track surface. Safety of users
Unnamed dead-end tracks, vicinity of King Hut	P	Safety of users
Part of Monument Track (dead end track) near the Monument	P	Obsolete, redundant, duplicated or unnecessary track

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Road and Track Closures in State Forest in the North East continued

Road or Track Name	Closure Type	Reason for closure
Westons Track and adjoining dead end tracks	S	Protect water quality
Unnamed dead-end tracks, vicinity of Westons Track	P	Obsolete, redundant, duplicated or unnecessary track
Blacks Landing Track	S	Protect track surface
King Spur Logging Road	P	Rehabilitated. Walking track only
Unnamed tracks (x2) south of Cambatong Road to the Broken River	S	Protect track surface, protect water quality
Jamieson River Valley		
Silvermine Spur Track	S	Protect track surface. Protect water quality
Axe Track	S	Protect track surface. Protect water quality
Furgusons Track	S	Protect track surface. Protect water quality
Gallows Track	S	Protect track surface. Protect water quality
Kilpatrick Track	S	Protect track surface. Protect water quality
South Jamieson Road	P	Obsolete, redundant, duplicated or unnecessary track
Stanley State forest (Murmungee Basin)		
Shepherds Track	S	Protect track surface
Murmungee Track	S	Protect track surface
Murray River [1]		
Tracks at Granthams Bend	S	Protect track surface
Tracks at St Leonards Bend	S	Protect track surface
Tracks at Police Paddocks	S	Protect track surface
Mitta Mitta area		
Six Mile Track (Harkers Creek Saddle to Dartmouth Boat Ramp)	S	Protect track surface
Holloway Logging Road (Holloway mill site to Sheevers Spur)	S	Protect track surface
Lightning Creek Track between Omeo Highway and Razorback Spur Track	S	Protect track surface, protection of conservation values, (Spotted Tree Frog habitat)
Big Spur Road	R	Rehabilitated
Bull Hill Road, East Branch	R	Rehabilitated
Gentle Annie to 6 Mile Link track	R	Rehabilitated
Mt Tawonga duplication	R	Rehabilitated
Mt Martin dead-end tracks	R	Rehabilitated
Granite Peak Track	R	Rehabilitated
The Hollow Way duplicated section	P	Obsolete, redundant, duplicated or unnecessary track
Bright/Mt Beauty/Myrtlefordarea		
West Kiewa Logging Road	S	Protect track surface
West Kiewa Fire Track (southern end)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (x2 running east from West Kiewa Logging Road to towards the Niggerheads)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (running east from West Kiewa Logging Road, near Bogong Jack Creek)	P	Obsolete, redundant, duplicated or unnecessary track
Dungeys Track	S	Protect track surface
Dungeys Track (duplicated sections)	P	Obsolete, redundant, duplicated or unnecessary track
Stony Top Track (1.8 km north of Alpine NP)	S	Protect track surface
Big Hill Cattle Track	Pr	Protection of water quality (Kiewa Hydro Scheme)
Big Hill Fire Track	Pr	Protection of water quality (Kiewa Hydro Scheme)
Woollybutt Spur Track	Pr	Protection of water quality (Kiewa Hydro Scheme)
West Link Track	Pr	Protection of water quality (Kiewa Hydro Scheme)
Spring Saddle Track	Pr	Protection of water quality (Kiewa Hydro Scheme)

1. Managed by Parks Victoria under Service Agreement

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Road and Track Closures in State Forest in the North East continued

Road or Track Name	Closure Type	Reason for closure
Unnamed track (from Gluepot Track to Mullindolingong)	P	Obsolete, redundant, duplicated or unnecessary track
McCreadys Track (off Dandongadale Track)	S	Protect track surface
Dandongadale Track	S	Protect track surface
Razor Track	S	Protect track surface
Unnamed tracks (x3 off Stony Creek Road)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (off North House Creek Track, Mt Jack)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed tracks (x3 linking Smart Creek–Tawonga Gap Track to the south end of VPC Running Greek Plantation)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track on western boundary near De Piazzas Lane, Mudgegonga	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (Tawonga Gap Track to Simmonds Creek Road)	Pr	Protect track surface. Walking track only
Yarrabulla Creek Track (South of Powerline to Yarrabuck Creek Track)	P	Protection of water quality Obsolete, redundant, duplicated or unnecessary track
Black Hole Road	R	Rehabilitated
East Branch Track	R	Rehabilitated
Furlong Track and 2 adjoining dead end tracks	P	Obsolete, redundant, duplicated or unnecessary track. Protect water quality
Shelley area:		
Unnamed track in Lucyvale Creek Reference area	R	Rehabilitated
Unnamed dead-end tracks (2) running east from Cravensville Road near Mt Cudgewa	R	Rehabilitated
Unnamed dead-end track running south from Lucky Hit Road	R	Rehabilitated
Corryong/Upper Murray		
Wild Boar Track (small section, east end)	P	Obsolete, redundant, duplicated or unnecessary track
Shady Creek Upper Track	S	Protect track surface
Surveyors Creek Track (Surveyors Gap to Murray River)	S	Protect track surface
Tin Creek Road	S	Protect track surface
Tin Creek Track	R	Rehabilitated
Tin Mine Track	R	Rehabilitated
Fern Track	R	Rehabilitate
Blue Gum Ridge Track	S	Protect track surface
Unnamed dead end track (mining track to summit of Mt Morgan)	R	Rehabilitated
Whitfield area		
Thistle Head Track	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track from Myrrhee south towards Drum Top	R	Rehabilitated
Unnamed track (running north from Patrol Track 250 m east of Black Range Track junction)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed Track, along Ryans Creek (north of McCallsay Reservoir)	Pr	Protection of water quality
Unnamed Track (in Reference Area and along King River West Branch)	P	Protect Conservation or Reference Area

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Road and Track Closures in State Forest in the North East continued

Road or Track Name	Closure Type	Reason for closure
South of Dividing Range: Tea Tree Range, Mt Selwyn, Mt Murray, Wonnangatta Valley, Wongungarra River		
Decimal Creek Track	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (x3, off McKenzie Track, 2 km east of Mt Sarah)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (linking Sarah Spur Track and McKenzie Track 2.5 km east of Mt Sarah)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (near junction of Tea Tree Range Track and Mt Hart Track to Hart Spur Track)	P	Obsolete, redundant, duplicated or unnecessary track
Four tracks south and east of High Point on Tea Tree Range. Includes dead-end sections of Croft Track and Selwyn Creek Road, one unnamed dead-end track and one of the two link tracks from Tea Tree Range Road to Selwyn Creek Road. (One ridge track running ESE from High Point remains open to link Tea Tree Range Road and Selwyn Creek Road).	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (running south-west from Galbraith Saddle)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (2 branches running west from Tea Tree Road)	P	Obsolete, redundant, duplicated or unnecessary track
Unnamed track (linking Tea Tree and Selwyn Roads 2.5 km north of Galbraith Saddle)	P	Obsolete, redundant, duplicated or unnecessary track
Humffray River Track	S	Protect track surface
Whites Track	S	Protect track surface
Water Spur Track	S	Protect track surface
Wongungarra Track	Pr	Protection of water quality Protection of conservation values (Spotted Tree Frog habitat). Preference to vehicle-free recreation
Unnamed track (linking Wongungarra Track and Blue Rag Range Track)	P	Obsolete, redundant, duplicated or unnecessary track Protection of water quality Protection of conservation values (Spotted Tree Frog habitat) Preference to vehicle-free recreation
Blowfly Spur Track	Pr	Protection of water quality Protection of conservation values (Spotted Tree Frog habitat). Preference to vehicle-free recreation
Unnamed track (3 branches running west from East Riley Road)	P	Obsolete, redundant, duplicated or unnecessary track

Closure Types:
- **S** Seasonal closure of roads and tracks
- **P** Permanent closure of roads and tracks, requiring rehabilitation
- **Pr** Permanent closure of roads and tracks, allowing restricted access only
- **R** Rehabilitated tracks that need to be removed from maps of the current road network. They will only be re-opened in the case of a fire or other emergency
- **P*** Permanent closure and rehabilitation unless the whole road is scheduled for immediate road improvement work for commercial timber harvesting purposes

APPENDIX Z

LIST OF INDIVIDUALS AND ORGANISATIONS WHO MADE SUBMISSIONS IN RESPONSE TO THE PROPOSED NORTH EAST FOREST MANGEMENT PLAN

Angus Pollock
Australian Motorcycle Trail Riders Association
Beechworth Environment Group
Bird Observers Club of Australia
Camillo De Grazia
Crail Stannard
David Buntine
Derrick Rolland
Dual Sport Motorcycle Riders Association
East Gippsland Catchment Management Authority
Forest Protection Society
Friends of the Earth Fitzroy
Mr Geoff Lucas

Gibberagee Bed and Breakfast Host Farm
Goulburn Broken Catchment management Authority
Goulburn-Murray Water
Jenny Dingwall
Ken Downing and Family
Ken Robinson
Mr L Stanley
Land-Rover Owners Club
Licensee Koetong Hotel
Linda Labart
Lisa Sargent
Marbut
Michael Lockwood
Mt Beauty Timber Industries Pty Ltd
Mt Lawson Winery
Neville Smith Timber Industries Pty Ltd
North East Catchment Management Authority
Parks Victoria
Paul Jones
Penny Davidson
Phillip Randall
Prospectors and Miners Association – Gippsland Branch
Prospectors and Mining Association Inc. – Gippsland Branch
Mr R J Ritchie
Robert Miller
Sporting Shooters Association
T and G Sullivan
Upper Murray Catchment Farm Tree Group
Victorian Apiarists Association Inc.
Victorian Association of Forest Industries
Victorian Association of Four Wheel Drive Clubs Inc.
Victorian Chamber of Mines Inc.
Victorian National Parks Association