Department of Sustainability and Environment

Code of Practice

for timber production 2007

A Victorian Government initiative

Victoria The Place To Be

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Code of Practice
for Timber Production
2007

Foreword

Our timber industry is one of the State's great assets, providing sustainable employment for thousands of regional Victorians while creating products used every day in all of our lives.

Besides providing high quality and durable timbers for a variety of uses, our native forests welcome millions of recreational visitors each year and have a major role in conserving biodiversity. Forestry activities are closely scrutinised by a public that expects our unique forest ecosystems to be protected for current and future generations to enjoy, while continuing to satisfy our need for sustainable timber products.

Through the *Our Forests, Our Future* strategy the Victorian Government has demonstrated its commitment to managing forestry sustainably for the long term. Plantations have expanded considerably over the last ten years, diversifying our resource base and creating an additional income source for regional Victorians.

Major industry participants are now seeking independent certification of their activities and processes, demonstrating their willingness to compete at an international level in providing these sustainable timber products.

I consider Victoria's forestry practices to be among the best in the world. This C*ode of Practice for Timber Production* has played and will continue to play a vital role in setting the foundations for a responsible, innovative and well-regulated industry.

This latest revision of the Code incorporates advances in scientific knowledge, significant changes in legislation and regulation governing forest management in Victoria, and improvements in operational practices over the last ten years.

Regular ongoing review of the Code will maintain its vital role providing direction and guidance to forest managers and operators to deliver sound environmental performance when undertaking commercial timber growing and harvesting operations.

In doing so, the Code supports the Victorian Government's commitment to managing the multiple roles of our forests and plantations in maintaining our natural heritage, biodiversity, health, wellbeing and prosperity.

Despite the many challenges facing the timber industry, such as climate change with it's associated drought and bushfire risks, I am confident Victorian forestry will be providing future generations with quality, durable and sustainable wood products.

John Thwaites
Minister for Water, Environment and Climate Change

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Expanatory notes

Timber and fibre harvested from Victoria's native forests and plantations are vital to our way of life, providing a renewable, adaptable resource with a wide variety of uses. Timber production activities are an important component of regional economies across Victoria, creating jobs and wealth that are a cornerstone of the State's prosperity.

Wood products have long been harvested from our native forests. Over the past several decades, other users and uses of forests, such as biodiversity protection, clean water and recreation opportunities have become increasingly important to the community. National parks and other conservation reserves have been declared in areas that were once available for timber harvesting, and public scrutiny of forest operations is now acknowledged as integral to the right to use this natural resource.

Wood grown in plantations helps to supplement native forest grown sawlogs and can provide good commercial returns while potentially improving the health of catchments, diversifying farm income or providing another productive use for agricultural land.

Victoria has benefited significantly from a long period of scientific research and field based forest management experience. As knowledge of Australia's ecosystems continues to develop, there is a corresponding improvement in the management of forests that will ensure activities are undertaken within sound ecological limits to ensure a sustainable long-term path for this industry.

In 1989, the Victorian Parliament ratified the first *Code of Forest Practices for Timber Production*. The Code set out appropriate, responsible standards for timber production in State forests, to better manage the potential impacts of timber harvesting. The Code was revised in 1996 to take account of new research information and field experience over the previous six years, and from the implementation of the Code on private land, which took effect in late 1993.

This 2007 revision of the Code incorporates advances in scientific knowledge, the substantial changes in legislation and regulation governing forest management in Victoria and improvements in operational practices over the last ten years.

The Code is prepared under Part 5 of the *Conservation, Forests and Lands Act 1987*.

The Code will continue to be reviewed on a regular basis, with the next review to be completed within ten years, informed by a comprehensive review of relevant forestry science.

Why a Code of Practice for Timber Production?

Maintaining the benefits to society provided by forestry depends on balancing community needs and concerns with careful stewardship and responsible management. The effective implementation of a Code of Practice helps to ensure that the activities of timber growing and harvesting are compatible with the conservation of the wide range of values associated with forests, and of any such values associated with land on which commercial plantation development is proposed.

Purpose of the Code

The purpose of this Code of Practice is to provide direction and guidance to forest managers and operators to deliver sound environmental performance when undertaking commercial timber growing and harvesting operations in such a way that:

- permits an economically viable, internationally competitive, sustainable timber industry;
- is compatible with the conservation of the wide range of environmental, social and cultural values associated with timber production forests;
- provides for the ecologically sustainable management of native forests proposed for continuous timber production;
- enhances public confidence in the management of Victoria's forests and plantations for timber production.

The Code applies to forest management planning and operations on land that is available for timber production. On public land, broader land management decisions, such as which forest areas are reserved for timber production, are dealt with by other processes and are not covered by the Code.

Additional documents that may provide guidance for forest managers and operators to meet the requirements of the Code are listed in Appendix B.

Scope of the Code

The Code covers all timber production operations on both public and private land in Victoria. The Code aims to ensure that:

- native forest is adequately regenerated and managed following timber harvesting;
- impacts on environmental values (including soil, water, biodiversity) are avoided or minimised; and
- social and cultural values (Aboriginal cultural heritage places, historic places and landscapes) are maintained, protected and respected.

Organisation of the Code

The Code is organised into four chapters. These are:

1. General – Code Principles
2. Application of the Code – Public Forests
3. Application of the Code – Private Native Forests
4. Application of the Code – Plantations

Chapter one outlines the seven Code Principles, which are based on the Montreal process and criteria. Chapters two to four cover the various activities that make up timber production across tenures and forest types. Operational goals, mandatory actions, guidance and legal requirements are set out in these chapters.

Forest management in Victoria is governed by a wide range of Commonwealth and State legislation, regulations, policies and codes. Some of the relevant legislation and regulations that must be adhered to is listed in Appendix A.

Fire management is a broad and complex subject and this Code deals with it only in its direct relationship to timber production. Other aspects of fire management are dealt with under the *Code of Practice for Fire Management on Public Land 2006* and the C*ountry Fire Authority Act 1958* and related regulations.

All specific terms referred to in the Code are defined in the Glossary.

Description of Land to which Code Applies

The *Code of Practice for Timber Production* applies to all land in the State of Victoria that is either being used for or is intended to be used for timber production.

Compliance with this Code on public land (chapter two) is required under the conditions of licences and authorities issued under the provisions of the *Conservation, Forests and Lands Act 1987*, the *Forests Act 1958* and the *Sustainable Forests (Timber) Act 2004*.

The Code applies to all commercial timber production on private land and leased Crown land (chapters three and four), as specified in Clause 17.07 of the Victoria Planning Provisions (VPPs) and all planning schemes.

The Code does not apply to agroforestry, windbreaks or other amenity plantings, or to the occasional felling of trees for local uses on the same property or by the same landowner or manager. Small plantations and woodlots of five hectares or less are also exempt from the Code, as are plantings established for non-commercial purposes. The Code does not apply to revegetation operations conducted for the purposes of erosion or salinity control.

The Secretary of the Department of Sustainability and Environment is a referral authority for timber production applications as specified in Clause 66 of the VPPs and all planning schemes.

This Code is consistent with the Victoria Planning Provisions in recognising that plantations are established primarily for timber production. Thus, planning controls concerned with the development of plantations explicitly allow for their subsequent management and harvesting.

Monitoring and Compliance

Where this Code refers to an "Approved" plan this means a plan or practice that is

(a) in the case of public land, approved by the Secretary of DSE; or

(b) in the case of private land, authorised by the Responsible Authority (usually local government) in accordance with a planning scheme or a permit issued under a planning scheme.

Public Land

Under the *Sustainable Forests (Timber) Act 2004*, compliance with this Code of Practice is mandatory for any person undertaking timber harvesting on public land. Under the *Sustainable Forests (Timber Harvesting) Regulations 200*6, penalties for non-compliance may apply if operations on public land are not in accordance with the Code.

The Department of Sustainability and Environment is responsible for ensuring compliance with the Code on public land. Compliance by forest operators with the requirements of this Code on public land is monitored by authorised officers appointed pursuant to the *Conservation, Forests and Lands Act 1987*.

Compliance is additionally monitored through an external independent audit process, the results of which are reported publicly. Audit findings inform the refinement of the Code and supporting documentation to ensure the effectiveness of the Code in achieving its outcomes.

Private Land

Timber production is a defined land use in the VPPs and all planning schemes. Clause 52.18 specifies the provisions relating to timber production and this Code is an incorporated document which must be considered.

Local government is responsible for ensuring compliance with the planning system. The Code must be complied with to the satisfaction of the responsible authority (usually local government), whether or not a permit is required.

In addition, forestry operators on private land may also choose to adopt independent product accreditation under national and international systems, which have associated performance criteria and auditing requirements that meet or exceed the requirements of this Code.

Terminology

The following terms are used in the Code to provide a structure for the Code's intended outcomes and the mechanisms within the Code to achieve these.

A **Code Principle** is a broad outcome that expresses the intent of the Code for each aspect of sustainable forest management.

An **Operational Goal** states the desired outcome or goal for each of the specific areas of timber production operations, to meet the Code Principles.

Mandatory Actions are actions to be conducted in order to achieve each operational goal. Forest managers and operators must undertake all relevant mandatory actions to meet the objectives of the Code. Mandatory actions are focussed on practices or activities. Failure to undertake a relevant Mandatory Action would result in non-compliance with this Code.

Legal Requirements identifies some of the laws of the State of Victoria or the Commonwealth that may be particularly relevant to an activity. To assist the forest owner and manager, this Code of Practice identifies legislation, regulations and codes that must be observed. The list may not be comprehensive, and obligations may change during the life of this Code. It is the responsibility of the user to ensure that all relevant legal requirements are met.

Guidance provides possible means for achieving Operational Goals or Mandatory Actions, including reference to documents that may assist forest managers. Forest managers and operators are not obliged to conduct any of the actions covered under Guidance. This allows for innovation and advances in technology to provide continual improvement in addressing the requirements of the Code. Failure to undertake any Guidance action does not in itself constitute non-compliance with the Code, however it should be noted that Guidance generally supports or expands upon Mandatory Actions.

DSE has prepared Management Procedures for application on public land, providing practical, detailed operational instructions for specific forest types across Victoria. These Management Procedures are consistent with the Operational Goals and Mandatory Actions of this Code and must be complied with for operations on public land. The Management Procedures are publicly available and are reviewed annually. They incorporate the outcomes of new research or findings of Code audits.

Similar documents may be prepared for private land operations to assist in interpreting and applying the requirements of this Code into specific rules and requirements, however these must always be consistent with this Code.

Note: This Code of Practice refers to various laws and policies, both of the State of Victoria and the Commonwealth. These laws and policies may be subject to change in the future and the reader should not rely on this Code for an accurate statement of the current laws and policies that may be in force at a particular time.

DSE maintains a website for this Code of Practice. New State policies and other information relevant to the Code, including links to referenced documents, are available on the site. Refer to www.dse.vic.gov.au/forestry/code/

1.1 Code Principles

Forest practices for timber production on all native forest and plantations in Victoria are guided by the Code Principles described in Table 1. The Code Principles express the broad outcomes of the intent of the Code for each aspect of sustainable forest management.

The seven Code Principles are developed from the internationally recognised Montreal Process criteria, and are consistent with the objectives of the *Sustainability Charter for Victoria's State forests*. Reporting mechanisms such as *Victoria's State of the Forests Report* use the same principles, and demonstrate Victoria's commitment to being an international leader in sustainable forest management.

The seven Code Principles are that:

1. Biological diversity and the ecological characteristics of native flora and fauna within forests are maintained.
2. The ecologically sustainable long-term timber production capacity of forests managed for timber production is maintained or enhanced.
3. Forest ecosystem health and vitality is monitored and managed to reduce pest and weed impacts.
4. Soil and water assets within forests are conserved. River health is maintained or improved.
5. Aboriginal and non-Aboriginal cultural heritage values within forests are protected and respected.
6. A safe working environment is provided for all forest workers.
7. Forest management planning is conducted in a way that meets all legal obligations and operational requirements.

Timber growing and harvesting must always be planned and conducted according to knowledge developed from research and management experience so as to achieve the intent of the Code Principles. Application of this knowledge will ensure that timber can continue to be utilised while ensuring that impacts on water catchments and streams, biodiversity, forested landscapes and significant archaeological, historic and other cultural heritage sites are avoided or minimised.

In Table 1, the Operational Goals of the Code are aligned with each of the seven Code Principles. These Operational Goals are repeated in the body of the Code, with a variety of Mandatory Actions to achieve each Goal. This framework translates the high level Principles into on-ground action.

Table 1 Relationship between Code Principles and Operational Goals

Code Principles	Operational Goals	Section
1. Biological diversity and ecological characteristics of native flora and fauna within forests are maintained.	Planning, harvesting and silvicultural operations in native forests specifically address the conservation of biodiversity, in accordance with relevant legislation and regulations, and considering relevant scientific knowledge.	2.2.2, 3.2.2 Conservation of Biodiversity
	Harvested native forest is managed to ensure that the forest is regenerated and that the biodiversity of the native forest is perpetuated. The natural floristic composition and representative gene pools are maintained when regenerating native forests by using appropriate seed sources and mixes of dominant species.	2.3.1, 3.3.1 Regeneration
	Planning and all operations in plantations address the conservation of biodiversity, including rainforest, in accordance with relevant laws.	4.2.2 Conservation of biodiversity
2. The ecologically sustainable long-term timber production capacity of forests managed for timber production is maintained or enhanced.	Timber harvesting operations are planned to meet all relevant requirements of this *Code of Practice for Timber Production*. Forest Management Plans are prepared to cover all Forest Management Areas.	2.1 Forest planning
	Stocking and early seedling growth is monitored and remedial action is taken where necessary to successfully regenerate harvested areas of native forests.	2.3.2, 3.3.2
	The productive capacity and other values of the forest are maintained or enhanced by appropriate tending of stands.	2.3.3, 3.3.3
	The planning and management of permanent and temporary roads for timber cartage and machinery transport is fit for intended purpose, and protects environmental and cultural values and the safety of all road users.	2.4, 3.4 Roading
	The management of all roads that are part of plantation operations takes account of environmental and cultural values, the safety of road users and the intended use of the road.	4.4. Plantation Roading
	Timber harvesting is conducted in a manner appropriate to the site, to manage the impact on soil, water and other values, including biodiversity and cultural heritage.	2.5, 3.5, 4.5 Timber Harvesting

Code Principles	Operational Goals	Section
3. Forest ecosystem health and vitality is monitored and managed to reduce pest and weed impacts.	Forest [Plantation] health is monitored and maintained by employing appropriate preventative, protective and remedial measures.	2.3.4, 3.3.4, 4.3.3 Forest [Plantation] Health
4. Soil and water assets within forests are conserved. River health is maintained or improved.	Water availability in catchments used for water supply and in water supply protection areas is protected.	2.1 Forest planning
	Water quality and river health are maintained or improved by protecting waterways from disturbance. Soil erosion and water pollution are minimised by avoiding harvesting in inappropriate areas or slopes and undertaking necessary preventive measures.	2.2.1, 3.2.1, 4.2.1 Water Quality, River Health and Soil Protection
	Chemicals are only used where appropriate to the site conditions and is conducted with due care for the maintenance of forest health, water quality, biodiversity and soil values.	2.3.4, 3.3.4
	Fertiliser and chemicals are only used where appropriate to the site conditions and circumstances and with care for the maintenance and protection of water quality, biodiversity, soil values and neighbouring land uses.	4.3.2 Chemical Usage
	During or following wet weather conditions, timber harvesting operations are modified or where necessary suspended to minimise risks to soil and water quality values.	2.5, 3.5 Timber Harvesting
	Site preparation operations are appropriate to the characteristics of the particular site, and take into account the maintenance of soil and water values as well as site productivity.	4.3.1 Site Preparation
5. Aboriginal and non-Aboriginal cultural heritage values within forests are protected and respected.	Aboriginal cultural heritage places are identified, protected and managed in accordance with relevant State and/or Commonwealth legislation, with Traditional Owners and any other relevant Aboriginal groups actively engaged in the process.	2.1, 3.1 Forest planning
	Sites and places of conservation and non-Aboriginal cultural heritage significance are protected as required by law.	2.1, 3.1 Forest planning, 4.1 Plantation planning and design

Code Principles	Operational Goals	Section
6. A safe working environment is provided for all forest workers.	All operations are conducted in a manner that meets all safety and duty of care requirements.	2.5.4, 3.5.4, 4.5.4 Safety
7. Forest management planning is conducted in a way that meets all legal obligations and operational requirements.	Forest management operations are planned and conducted to achieve sustainable forest management, in accordance with all relevant Commonwealth and State legislation, regulations, government policies and local government regulations.	2.1, 3.1 Forest Planning
	New or upgraded roads are to be designed to a standard capable of carrying anticipated traffic with reasonable safety, and ensuring the protection of water quality and river health, biodiversity conservation values, and Aboriginal cultural heritage.	2.4.2, 3.4.2 Road Design
	Plantations are designed, managed and operated in accordance with all relevant legal requirements. Local government is appropriately informed of new plantation development by the lodgement of either a Plantation Development Notice or a planning permit, in accordance with this Code.	4.1 Plantation planning and design
	For DSE managed operations, a Wood Utilisation Plan is prepared in accordance with the *Conservation, Forests and Lands Act 1987* and approved by the DSE Regional Director prior to the release of coupes for harvesting for DSE managed operations. For VicForests managed operations, a Timber Release Plan is prepared in accordance with the *Sustainable Forest (Timber) Act 2004* and approved by the DSE Secretary in accordance with that Act prior to the release of coupes for harvesting for VicForests managed operations.	2.1.2 Wood Utilisation Plan or Timber Release Plan
	A Forest Coupe Plan which specifies operational requirements, is prepared in accordance with this Code prior to the commencement of each timber harvesting operation.	2.1.3
	Approval for timber production activities in native forests is obtained through the relevant planning scheme.	3.1 Forest Planning
	A Timber Harvesting Plan is prepared in accordance with the requirements of this Code and submitted to the relevant local government prior to the commencement of harvesting operations.	3.1.1, 4.5.1 Timber Harvesting Plan

Chapter 2

Application of the Code – Public Forests

2

This Chapter applies to the planning, regenerating, tending, harvesting and roading of public forests that are managed for timber production, including both native forests and plantation forests, that are owned and managed by the State.

2.1 Forest Planning

Planning ensures that our State forests are managed in a sustainable manner. Commercial and non-commercial values of forests are integrated so that both the material and non-material welfare of society is improved, whilst ensuring that the values of forests, both as a resource for commercial use and for conservation, are not lost or degraded for current and future generations. These values include ecological diversity, Aboriginal and other cultural values, landscape, provision of recreation and educational opportunities as well as a range of forest products.

Forest management is a continuing process, responsive to changing community expectations, expanding knowledge of forest ecosystems and techniques to improve planning approaches.

Planning of forest operations for timber production is critical to achieving the environmental outcomes encompassed by the Code. Forest management planning provides clear documentation of intended reservation of areas, measures to protect the environment and proposed forestry operations such as regeneration, tending, harvesting, haulage and roading within forested areas managed for timber production.

Figure 1: Forest Management Areas in Victoria

Operational Goals

Forest management operations are planned and conducted to achieve sustainable forest management, in accordance with all relevant laws, regulations, government policies and local government requirements.

Timber production operations are planned to meet all relevant requirements of this *Code of Practice for Timber Production.*

Aboriginal cultural heritage places are identified, protected and managed in accordance with relevant State and/or Commonwealth legislation, with Traditional Owners and any other relevant Aboriginal groups actively engaged in the process.

Sites and places of conservation and non-Aboriginal cultural heritage significance are protected as required by law.

Water availability in catchments used for water supply and in water supply protection areas is protected.

2.1.1 Forest Management Plans

Forest Management Plans have been prepared, or are in preparation, for all Forest Management Areas in State forest in Victoria (Figure 1). Forest Management Plans are the fundamental plan for the sustainable management of environmental, social, cultural and economic values within each area.

Forest Management Plans identify three management zones within State forest: the Special Protection Zone (SPZ); the Special Management Zone (SMZ); and the General Management Zone (GMZ).

SPZs are managed for particular conservation values, forming a network designed to complement the formal conservation reserve system. Timber harvesting is excluded from this zone. SMZs are managed to conserve specific features, while catering for timber production under specific management conditions. GMZs are managed for a range of uses and values, but timber production will have a high priority. Modifications to management zone locations and conditions may be undertaken from time to time to reflect new knowledge (such as the discovery of a threatened species).

All zones are managed within the meaning of sustainable forest management found in the *Sustainable Forests (Timber) Act 2004.*

Operational Goal

Forest Management Plans are prepared for all Forest Management Areas in State forest in Victoria.

Mandatory Actions

Forest Management Plans for each Forest Management Area must:

- be consistent with this Code of Practice and with all relevant Acts, agreements and policies of the Victorian Government;
- strategically assess and address the management and protection of environmental, cultural and resource values at the regional level and for the long-term;
- recognise the contribution of forest and forest resource use to the economic and social wellbeing of Victorians;
- be planned and implemented to ensure the forest provides continued opportunities for public recreation, scientific study and education;
- aim to achieve sustainable forest management, which includes the maintenance of environmental and cultural values and the sustainable use of natural resources;
- provide for the maintenance of regional biodiversity;
- provide for the maintenance or enhancement of water quality, water quantity and river health;
- identify and mitigate against potential threats such as weeds, pests and pathogens;
- strategically identify and address the management and protection of Aboriginal cultural heritage values, engaging Traditional Owners and any other relevant Aboriginal groups in the planning process;
- provide a basis for monitoring and reviewing management performance;
- be periodically reviewed, incorporating any relevant research; and
- include public participation in their development process.

Further prescriptions or procedures may be developed to provide practical, detailed operational instructions that are applicable in a particular region, in recognition of the variety of forest and land types across Victoria. Any prescriptions that are developed must be consistent with all relevant Operational Goals and Mandatory Actions of this Code.

2.1.2 Wood Utilisation Plans or Timber Release Plans

Wood Utilisation Plans (WUPs) are prepared annually for all commercial DSE forestry operations in State forests. WUPs provide a list of areas scheduled to be harvested, associated road requirements; details of the location and approximate timing of timber harvesting in the proposed coupes; and details of the location of any associated access roads. DSE has prepared Guidelines for the preparation of these Plans, which are publicly available and provide further detail on their preparation and contents.

Timber Release Plans (TRPs) are prepared by VicForests under Part 5 of the *Sustainable Forests (Timber) Act 2004*. A Timber Release Plan includes: schedules of coupes selected for timber harvesting and associated access road requirements; details of the location and approximate timing of timber harvesting in the proposed coupes; details of the location of any associated access roads; and area, silvicultural type and forest stand description.

Operational Goals

For DSE managed operations, a Wood Utilisation Plan is prepared in accordance with the *Conservation, Forests and Lands Act 1987* and approved by the DSE Regional Director prior to the release of coupes for harvesting.

For VicForests managed operations, a Timber Release Plan is prepared in accordance with the *Sustainable Forests (Timber) Act 2004* and approved by the DSE Secretary in accordance with that Act prior to the release of coupes to VicForests for harvesting.

Mandatory Actions

Schedules of coupes selected for timber harvesting and associated access roading must be described in the Wood Utilisation Plan or Timber Release Plan.

A Wood Utilisation Plan or Timber Release Plan must:

- be consistent with this Code of Practice and with the relevant Forest Management Plan;
- minimise impact on biodiversity and provide for the maintenance of a range of forest age classes and structures;
- identify and mitigate impacts on Aboriginal cultural heritage values, in consultation with Traditional Owners and any other relevant Aboriginal groups;
- minimise the impact of harvesting on water quality and quantity over a period of time within any particular catchment;
- permit the effective and efficient utilisation of felled trees;
- take account of forest type, the silvicultural system to be employed, and the needs of the regeneration program;
- minimise adverse visual impact and consider effects on areas of landscape sensitivity;
- meet legal timber supply obligations;
- specify the location of coupes;
- show the location of major access roading[1], including extensions or upgrading of the permanent road network; and
- be available for public scrutiny.

1 Coupe access roads (ie. roads less than 500 metres in length terminating in a coupe) are not required to be identified on the WUP or TRP, except where significant environmental considerations (eg. presence of rainforest) must be planned for.

Coupe location and dispersion of coupes within the forest will be consistent with Forest Management Plan strategies.

Special Plans must be prepared and approved where major salvage operations of timber are undertaken following wildfire, storms or other events, and must address recovery strategies for other forest values. Minor salvage operations may require modification of the existing Wood Utilisation or Timber Release Plan. Salvage harvesting must take as much account of environmental care as any other harvesting operation.

Legal Requirements

Cultural heritage management plans, developed in consultation with the Traditional Owners and relevant Aboriginal groups where appropriate, will be consistent with the *Aboriginal Heritage Act 2006*, other cultural heritage legislation, Victorian Aboriginal cultural heritage management practice and the Burra Charter.

Guidance

The Wood Utilisation Plan or Timber Release Plan is normally prepared for a multi-year period (three or five years, respectively) and is prepared using appropriate expertise.

The removal of trees as part of road construction activities for timber production will be considered within each Plan.

Each Plan will generally identify areas where forest stands can be managed more intensively through stand management practices such as thinning and/or fertilising, salvage fellings, pest control and other silvicultural methods to increase production of timber.

Where selection or thinning silvicultural systems are proposed, the area of forest to be harvested by any individual operation can be determined by the forest type, its stand condition and other relevant environmental factors.

2.1.3 Forest Coupe Plans

Forest Coupe Plans are prepared for each separate timber harvesting operation identified in the Wood Utilisation Plan or Timber Release Plan.

Operational Goal

A Forest Coupe Plan, which specifies operational requirements, is prepared in accordance with this Code prior to the commencement of each timber harvesting operation.

Mandatory Actions

A Forest Coupe Plan must be prepared in accordance with this Code of Practice, the relevant Forest Management Plan and any other relevant prescriptions or procedures, prior to the commencement of a timber harvesting operation.

The size of clear-felled, seed tree or shelterwood one coupes must not exceed 40 hectares net harvested area. Where appropriate, such coupes may be aggregated up to 120 hectares net harvested area over a period of up to five years. Aggregated coupes must not be contiguous (forming a coupe greater than 120 hectares within a five year period).

A thinning coupe must not exceed 120 hectares net harvested area.

Single tree selection coupes may be of any size, where landscape or environmental values are not affected.

Salvage coupes harvested under special salvage plans may exceed standard area limits.

Chapter 2

Application of the Code – Public Forests

Coupe boundaries must take advantage of topographic and artificial features where possible, with due regard to safety, operational requirements, landscape and environmental values. Where coupe boundaries do not follow obvious natural or artificial features, they must be clearly marked on site. Where the coupe boundary is determined by buffers to protect environmental values, such as waterways or rainforests, these must be marked on the plan and on-site.

Exclusion areas must be protected from timber harvesting operations and associated activities in accordance with relevant *Flora and Fauna Guarantee Act* Action Statements, the relevant Forest Management Plan and relevant legislation.

The Forest Coupe Plan must:

- include a map on which the area to be harvested and adjacent exclusion zones are shown and labelled;
- identify conditions applying to operations on the coupe;
- show the coupe location and cutting area boundaries;
- document any authorisations, such as the removal of tree(s) from buffers for safety purposes;
- state the area that is planned to be harvested;
- state the period during which operations are to occur;
- identify the silvicultural systems to be employed;
- map the soil erosion hazard class (or classes) and slope of the coupe area and associated operational restrictions;
- identify requirements for the location[2], design, construction, maintenance and closure of temporary roads;
- identify requirements for the design, siting, construction, use, and rehabilitation of log landings and dumps and, where necessary, siting and rehabilitation measures for major snig tracks;
- describe regeneration procedures to be applied;
- map areas within a coupe that are to be excluded from harvesting, or to which special prescriptions apply (including biodiversity protection or habitat enhancement, water quality and aquatic habitat protection, landscape protection, or cultural heritage sites and places), detailing any special conditions or prescriptions appropriate to protecting those sites;
- describe any particular measures employed to protect biodiversity (such as habitat tree retention); and
- describe measures to be employed to protect and rehabilitate soils and to maintain water quality.

A copy of the Forest Coupe Plan and any supporting prescriptions must be provided to the Harvesting Team Leader. The Plan's implementation, including specific prescriptions to be applied to the coupe, must be discussed with him/her. The Plan and supporting documents must be available on site while operations are in progress.

Boundaries and exclusion areas must be identified in the field through ground observation and specified on the Forest Coupe Plan. Where there is a potential for timber harvesting operations to affect adjacent exclusion areas, these exclusion areas must be shown on coupe plans.

2 The location of temporary roads and coupe infrastructure may be specified in the field and added subsequently to the commencement of operations.

Guidance

The Forest Coupe Plan may also include, and specify where necessary the:

- methods of marking;
- expected timber volumes to be removed;
- seasonal restrictions;
- fire protection restrictions; and
- procedures for approving amendments to the Plan.

Landscape values will generally be considered in the preparation of the Forest Management Plan. Appropriate coupe design and distribution may minimise adverse visual impact. The objective is to blend harvesting scenes with natural features of the landscape and particularly to minimise skyline impact.

Salvage operations in coupes affected by wildfire may need to consider any requirements of a rehabilitation plan prepared under the *Code of Practice for Fire Management on Public Land (2006)*.

2.2 Environmental Values in Public Forests

Timber production operations in native forests may have local impacts on environmental values such as water quality and biodiversity. Appropriate planning and management through the lifecycle of the operation can minimise these impacts. This section includes requirements that must be observed during planning, tending, roading and harvesting of public forests.

2.2.1 Water Quality, River Health and Soil Protection

The Code defines three classes of waterway relevant to forest operations in Victoria, being:
1. Permanent rivers and streams, pools and wetlands;
2. Temporary streams; and
3. Drainage lines.

Definitions and aids to the identification of each class of waterway are provided in the Glossary. The classification of a waterway is based on its characteristics prior to harvesting, noting that stream flow may change following harvesting.

Operational Goals

Water quality and river health are maintained or improved by protecting waterways from disturbance.

Soil erosion and water pollution are minimised by avoiding harvesting in inappropriate areas or slopes and undertaking necessary preventive measures.

Mandatory Actions

Storage, use and disposal of petroleum products and machinery servicing must not pollute the environment or result in littering. Waste oil, all empty drums, discarded machinery parts and other waste must be removed from the forest and taken to an approved disposal facility. Toilet wastes must not be allowed to enter a waterway.

Crossing of waterways must be minimised. Approved crossings must be shown on the Forest Coupe Plan. Where crossings involve the use of log culverts, these must be removed when harvesting (including any regeneration activities) is completed. When removing crossings, techniques that minimises soil disturbance must be used.

Waterways within and immediately adjacent to each coupe must be classified using the waterway classification system described above.

Water quality and river health must be protected by maintaining buffers and/or filter strips (to each side of the waterway) of not less than the widths specified in Table 2.

Table 2 Minimum width in metres for buffer strips (B) and filter strips (F) to be applied to various waterway categories, in relation to water quality risk and slope.

	Sites with low or moderate water quality risk	**Sites with high or very high water quality risk**	
Waterway Class	*Slope 0–30°*	*Slope 0–20°*	*Slope 21°–30°*
1. Pools, permanent streams and wetlands	20m B	30m B	40m B
2. Temporary streams	10m F	10m B + 10m F	20m B
3. Drainage lines	10m F	10m F	15m F

Notes: Slope is the average slope of the coupe area in the vicinity of the water body.

Buffers and filter strips must be applied to each waterway class regardless of the origins of the channelling.

The width of buffer areas and filter strips must be measured in the horizontal plane, from the edge of the saturated zone (at time of harvesting) or channel (whichever is greater), on each side of the waterway.

The potential risk to water quality is determined through consideration of:
- soil erodibility;
- soil permeability;
- rainfall erosivity;
- topography; and
- location of coupe infrastructure.

Additional measures to protect water quality and aquatic habitat (including widening buffers or filter strips) must be adopted within coupes where there is a high local risk due to:
- local topography;
- the intensity and magnitude of the harvesting operation; or
- the location of the operation in a declared Special Water Supply Catchment area or water supply protection area.

Outcomes of risk assessments, buffers and filter strips must be specified on the basis of field assessments, and subsequently identified on the Forest Coupe Plan. The location of buffers and filter strips must be easily distinguishable in the field, either through the use of geographic features or marking.

Operations within buffer areas

Trees must not be felled from within buffer areas unless the selective removal of trees for safety is approved by an authorised officer and documented in the Forest Coupe Plan.

Buffers must be protected from damage caused by trees felled in adjacent areas. Trees accidentally felled into buffers may be removed only where authorised and only if significant damage and disturbance of soil and vegetation within the buffer can be avoided. Removals must be noted on the Forest Coupe Plan.

Machinery must not enter a buffer area except for the construction and use of stream crossings as specified in the approved Forest Coupe Plan.

Pushing of fill or harvesting debris into a buffer or construction of drain structures within a buffer is not permitted except for the construction of an approved stream crossing.

Operations within filter strips
Trees may be felled from within filter strips. The felling of trees into filter strips must be avoided where possible.

Disturbance to soil and understorey vegetation from harvesting operations in filter strips must be minimised.

Machinery must not enter a filter strip, except at stream crossings as specified in the approved Forest Coupe Plan.

Pushing of fill or harvesting debris into a filter strip is not permitted except for the construction of an approved stream crossing.

Where temporary or log culverts are used, they must be removed immediately after harvesting or any subsequent regeneration work for which they are required, using a technique that minimises soil disturbance.

Operations on steep slopes
Timber harvesting must not occur on slopes where the operation cannot be conducted safely, threatens the stability of the soil or has high potential for adverse off-site effects. The potential for mass soil movement must be assessed and necessary preventative actions undertaken.

Harvesting operations must be excluded from slopes greater than 30 degrees. The exception to this is where there are small areas within coupes (not greater than 10 per cent of the net harvestable area within one coupe) that are greater than the maximum slope limit and may be harvested where the land is assessed as capable of supporting harvesting activities without risk of mass soil movement.

On slopes with a high soil erosion hazard or where there is an assessed risk of mass soil movement, additional measures must be taken to avoid movement of soil into streams, such as modification to harvesting methods or increasing of the widths of buffers and filter strips.

Legal Requirements
Measures to reduce the impact of timber harvesting on water quality and river health must take account of other requirements set out in Special Area Plans made under the *Catchment and Land Protection Act 1994*. Any particular requirements to increase buffers due to the location of a water supply off-take point or any other relevant requirements set out in Special Area Plans, must be observed.

There may be other special requirements for water quality and soil protection set out in a regional River Health Strategy, or a Water Quality Plan prepared by the relevant Catchment Management Authority or Melbourne Water. These plans may provide guidance on additional protection measures.

Guidance
Directing trees to fall out of filter strips may reduce soil disturbance.

Logging techniques specifically designed for steep slopes (such as cable logging) may be used to minimise soil movement.

Additional protection measures applied to protect waterways may include additional buffers and filter strips, or modified harvesting within parts of a coupe.

There are appropriate Australian Standards for the storage and handling of fuels, such as AS1940, that provide detailed practical guidance to minimise the risk of fuel spills.

2.2.2 Conservation of Biodiversity

Operational Goal

Planning, harvesting and silvicultural operations in native forests specifically address the conservation of biodiversity, in accordance with relevant legislation and regulations, and considering relevant scientific knowledge.

Mandatory Actions

Where fire is used in timber production operations, all practicable measures must be taken to protect all areas excluded from harvesting from the impacts of unplanned fire.

Forest management planning and all forestry operations must comply with measures specified in relevant Flora and Fauna Guarantee Action Statements and Flora and Fauna Guarantee Orders.

Rainforest communities in Victoria must not be harvested. Rainforest communities must be protected from the impacts of harvesting through the use of appropriate buffers to maintain microclimatic conditions and protect from disease and other disturbance.

To facilitate the protection of biodiversity values, the following matters must be addressed when developing and reviewing plans and must be adhered to during operations:

- application of the precautionary principle to the conservation of biodiversity values, consistent with monitoring and research to improve understanding of the effects of forest management on forest ecology and conservation values;
- consideration of the advice of relevant experts and relevant research in conservation biology and flora and fauna management at all stages of planning and operations;
- use of wildlife corridors, comprising appropriate widths of retained forest, to facilitate animal movement between patches of forest of varying ages and stages of development, and contributing to a linked system of reserves;
- providing appropriate undisturbed buffer areas around significant habitats;
- maintaining forest health and ecosystem resilience by managing pest plants, pest animals and pathogens; and
- modifying coupe size and dispersal in the landscape, and rotation periods, as appropriate.

At the coupe planning and harvesting level, the retention of habitat trees or patches and long-lived understorey elements in appropriate numbers and configurations, and provision for the continuity and replacement of old hollow-bearing trees within the harvestable area, must be allowed for.

Legal Requirements

The *Catchment and Land Protection Act 1994* requires all landholders to control pest animals and noxious weeds on their property.

The *Environment Protection and Biodiversity Conservation Act 1999* includes provisions to protect matters of national environmental significance, including listed threatened species and endangered ecological communities.

The *Wildlife Act 1975* contains provisions to protect wildlife and includes requirements relating to control of wildlife species causing damage.

The *Flora and Fauna Guarantee Act 1988* includes provisions relating to the handling of protected flora, the determination of Critical Habitat and the making of Interim Conservation Orders.

Guidance

The objective of habitat retention measures is to facilitate the continued occupation or recolonisation by all species that are likely to have occurred in the area prior to timber harvesting through protection of the ecosystem that supports them. Thus, no part of the harvested area will become permanently unsuitable for any species likely to have been resident or a regular visitor to the area before it was harvested.

Opportunities to improve the protection of threatened species or habitat values may include reserving further strategic areas from harvesting, or modifying harvesting and silvicultural techniques to achieve specific conservation objectives.

Where vegetation is retained, consideration should be given to the protection of retained vegetation during harvesting and subsequent management, and the effect of retained vegetation on the growth of future crop trees.

Streamside buffers may both protect water quality and act as a wildlife corridor. However, the need for corridors along or across other topographic features will arise and should be considered in relation to the forest type and fauna present.

When planning and undertaking regeneration burning operations, minimising slash near any retained vegetation (eg. buffer strips, habitat trees or patches or shelterwood one trees) will assist with its survival.

2.3 Forest Regeneration and Management

This section covers the regeneration of public forests and the subsequent management of such stands, where required. Unless required for another authorised purpose, all State forest areas that have been subject to timber harvesting in Victoria are successfully regenerated to approximate the original forest composition.

2.3.1 Regeneration

Operational Goals

Harvested native forest is managed to ensure that the forest is regenerated and the biodiversity of the native forest is perpetuated.

The natural floristic composition and representative gene pools are maintained when regenerating native forests by using appropriate seed sources and mixes of dominant species.

Mandatory Actions

State forest available for timber production must not be cleared to provide land for the establishment of plantations.

Action must be taken to ensure the successful regeneration of a harvested coupe, except where:

- the land is to be used for an authorised/approved purpose for which native vegetation is not compatible (for example, authorised/approved services and infrastructure, and structures); or
- timber has been harvested by thinning a stand; or
- the stocking of seedlings or regrowth is assessed as sufficient through natural regeneration processes (refer Mandatory Action 2.3.2).

Following timber harvesting, State forest must be regenerated with species native to the area, wherever possible using the same provenances, or if not available, from an ecologically similar locality.

Regeneration operations must aim to approximate the composition and spatial distribution of canopy species common to the coupe prior to harvesting, where they can be determined.

Silvicultural methods for regeneration must be appropriate to the forest type (including understorey species) and local conditions.

Where fire is used in regeneration operations, all practicable measures must be taken to protect all areas excluded from harvesting from the impacts of fire.

Where mechanical disturbance is used, it must be undertaken with due consideration of erosion risk potential and the proximity of waterways (refer to Section 2.2).

Action must be taken to ensure that any Aboriginal cultural heritage places located within harvested coupe areas are appropriately protected and managed during regeneration activities.

The source of seed used must be recorded in a manner that allows for future reference.

The use of poisons to control wildlife browsing is prohibited.

Legal Requirements

The use of pesticides in site preparation and/or seedling or regrowth/advanced growth liberation must comply with Commonwealth and State legislation and regulations.

Under the *Wildlife Act 1975*, browsing native animals that threaten regeneration may only be controlled under permits and in accordance with any associated conditions as issued by relevant authorities.

The use of fire must be in accordance with the *Code of Practice for Fire Management on Public Land* (2006). A regeneration burn is a prescribed burn and requires an approved Burn Plan under that Code.

Guidance
The regeneration of understorey species should be facilitated where possible, using harvesting and regeneration methods that provide appropriate disturbance to ensure understorey elements can survive, or that protect understorey patches.

DSE maintains guidelines and standards against which regeneration may be assessed, that may provide a useful reference for forest operators.

Where natural seedfall or sowing is used, surveys may be conducted to assess the quality of the seedbed before seed is applied.

A receptive seedbed for regeneration may be achieved by burning of the coupe either before or after harvest debris, or by mechanical disturbance as part of the harvesting operation or following it.

Burning of debris may reduce the fire hazard associated with large accumulations of flammable material and provide a receptive seedbed, but may affect the regeneration of fire sensitive species. Mechanical disturbance may degrade the soil or affect water quality and the regeneration of some species.

An ecologically similar locality for a species is from a similar elevation, aspect, soil type and/or climate, preferably as close as possible to the harvested area. Genetic testing may assist in determining similarity.

The screening or treatment of seed and nursery stock used in regeneration should ensure that the risk of spreading weeds, pathogens or pests is minimised.

The source of any seed used may be recorded on the Coupe Information System or equivalent database.

2.3.2 Stocking Assessment and Remedial Treatment

Operational Goal
Stocking and early seedling growth is monitored and remedial action is taken where necessary to successfully regenerate harvested areas of native forests.

Mandatory Actions
Stocking on harvested coupes must be assessed within three years of treatment, to determine whether regeneration has been successfully achieved and to ensure that re-treatment occurs where necessary.

The results of assessment must be recorded for future reference.

Where stocking, health or early growth is inadequate, remedial work must be conducted as soon as practicable to obtain adequate regeneration. Further assessment must be undertaken following remedial treatment to ensure that it has been successfully regenerated.

Guidance
Where selection (uneven-aged) silvicultural systems are used, stocking assessments should take account of retained trees.

The results of assessments and details of any further silvicultural treatments may be recorded on the Coupe Information System or equivalent database.

DSE maintains standards for the assessment of regeneration for various forest types and silvicultural systems.

2.3.3 Tending

Appropriate action may be taken to tend native timber production stands where consistent with environmental safeguards and offsite impacts are minimised. Examples of such action include stand improvement (such as overwood removal or reduction), thinning, fertilising, salvage fellings, and other silvicultural practices to promote stand health and timber production.

Operational Goal

The productive capacity and other values of the forest are maintained or enhanced by appropriate tending of stands.

Mandatory Actions

Tending operations must be planned and conducted in a manner that minimises adverse impacts on areas that are excluded from harvesting.

Legal Requirements

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the land owner to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

The use of chemicals for stem injection and the control of pests must be in accordance with relevant Commonwealth and State legislation, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994*, the *Agricultural and Veterinary Chemical (Control of Use) Act 1992* and associated regulations.

Guidance

DSE maintains standards and guidelines for undertaking thinning in various forest types.

2.3.4 Forest Health

Forest health is important for long-term ecological integrity and productivity of Victoria's forests. Forest health can be promoted through stand management practices (such as fire application, thinning, salvage felling, weed, pest and pathogen control), as required.

Operational Goals

Forest health is monitored and maintained by employing appropriate preventative, protective and remedial measures.

Chemicals are only used where appropriate to the site conditions and is conducted with due care for the maintenance of forest health, water quality, biodiversity and soil values.

Mandatory Actions

Chemical use must be appropriate to the circumstances and take into account the maintenance of biodiversity, water and soil quality.

When applying chemicals in a declared Special Water Supply Catchment Area, the relevant Water Authority must be notified prior to application.

If the introduction of a new or unknown exotic agent is suspected, Biosecurity Victoria must be informed.

Precautions must be taken to avoid the transport of any pest animal, pest plant or pathogen into or from a State forest, or from one place to another within a State forest. Any relevant procedures or guidelines must be followed. Where there is a known risk of introducing or spreading pest plants, pest animals and pathogens to the forest (for example, but not limited to *Armillaria* or *Phytophthora*), precautions must be taken and the risk minimised through appropriate treatment of equipment when moving from known infected areas.

Where Myrtle Wilt fungus (*Chalara australis*) is known to exist, precautionary measures must be applied to minimise the spread of this pathogen.

Legal Requirements

The use of chemicals for control of pests and pathogens must be in accordance with relevant Commonwealth and State legislation, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994*, the *Agricultural and Veterinary Chemical (Control of Use) Act 1992* and associated regulations.

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the land owner to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

Guidance

The risks posed by pest plants, pest animals and pathogens and other environmental stresses to forest health may be assessed regularly and systematically so that problems are detected early and appropriate remedial strategies are implemented. Pre-operations surveys can include soil sampling and testing for soil-borne pathogens as appropriate.

Various aspects of forest health may be monitored and documented (aided by photographic records as appropriate) in assessments, including crown and foliage condition, presence of damaging agents and description of damage levels.

Successful control or management of forest health problems may require coordinated action involving adjacent landholders and other forest owners.

Washing of machinery and equipment when moving between forest areas may assist in the control of the spread of some pathogens and weeds.

Where pesticides are used, a Pesticide Application Plan may be prepared that specifies the target pest(s), chemical(s), target area(s), application rates and method(s) and operational controls that will be adopted to minimise unintended off-target and off-site impacts. It could also address the process for any notifications required by law.

The fact sheet *Herbicides: guidelines for use in and around water* prepared by the Cooperative Research Centre for Australian Weed Management provides useful guidelines for the appropriate use of herbicides to control weeds near waterways.

Guidance on control measures for Myrtle Wilt can be found in the relevant *Flora and Fauna Guarantee Act* Action Statement.

2.4 Roading for Timber Production

This section covers the planning, location, design, construction, maintenance and use of permanent and temporary roads for timber haulage and machinery transport. This section does not consider requirements for snigging and forwarding tracks, which are covered under coupe infrastructure (Section 2.5.1).

Timber production roads have the potential to create significant environmental impacts, particularly on water quality and river health. This Code of Practice aims to protect a range of environmental values while allowing safe and economic roading for timber production.

Operational Goal

The planning and management of permanent and temporary roads for timber cartage and machinery transport is fit for purpose, protects environmental and cultural values, and the safety of all road users.

Legal Requirements

DSE is generally the coordinating and responsible Road Authority under the *Road Management Act 2004* for roads and tracks in State forests. The Road Authority must manage roads it is responsible for in accordance with the requirements of the *Road Management Act 2004* and any regulations, Codes of Practice or Road Management Plan made under that Act.

2.4.1 Road Planning

Mandatory Actions

Road planning and design for new and substantially upgraded roads must ensure the road network is adequate for the intended range of uses and users, while ensuring the protection of water quality and conservation values, including river health.

Road planning must:

- locate roads so as to minimise risks to environmental values, particularly soil, water quality and river health, during both construction and ongoing road use;
- locate roads so as to avoid and mitigate impacts on known Aboriginal cultural heritage places; and
- ensure that the timing of construction activities minimises risks associated with unsuitable weather conditions.

Existing roads must, where practicable, be used for access to a coupe or work site and to haul timber, except where it can be clearly demonstrated that a new or relocated road further minimises or removes existing threats to soil, water quality or biodiversity.

New roads must be located to avoid known cultural heritage sites.

Roads must avoid areas declared under the *Reference Areas Act 1978*.

Plans for the construction of permanent roads must be approved in advance of harvesting operations to enable the roads to be located on alignments and grades that provide the required standard of access without compromising safety, water quality and other environmental values.

Plans for roads must be based on field surveys to ensure that all environmentally sensitive locations are identified and appropriate design and construction techniques are adopted.

New road construction and significant improvement works on the existing road network must be identified in the Wood Utilisation Plan or Timber Release Plan.

Road planning must ensure protection of taxa and communities listed under the *Flora and Fauna Guarantee Act 1988* and avoidance or mitigation of listed potentially threatening processes. Road planning must comply with relevant Action Statements prepared under the *Flora and Fauna Guarantee Act 1988*.

Legal Requirements

Consistent with the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment, undertaken in collaboration with the relevant Traditional Owners, may be required.

Threatened species may be protected under the *Environment Protection and Biodiversity Conservation Act 1999* or the subject of an Interim Conservation Order under the *Flora and Fauna Guarantee Act 1988*.

Roads in State forest must be managed in accordance with the *Road Management Act 2004* by the designated authority.

Guidance

Preparing an erosion and sediment control plan prior to commencing major road construction or improvement works or bridge and other stream crossing construction will assist in managing this important issue during construction.

Assessing all stream crossings and bridges on planned cartage routes and undertaking necessary upgrades will assist in minimising water quality impacts due to increased traffic volumes while ensuring that timber haulage operations can be undertaken efficiently and safely.

New roads should avoid running parallel and in close proximity to streams, and the number of stream crossings should be minimised.

Roads should where possible be located to:

- avoid steep and unstable slopes and areas prone to landslips;
- minimise disturbance to streams, buffer strips, riparian vegetation and rainforest in areas not associated with approved crossings; and
- restrict the movement of side-cast material into streams or drainage lines.

Where necessary, the development of an Aboriginal cultural heritage management plan, in collaboration with Traditional Owners and any other relevant Aboriginal groups, will assist in identifying and mitigating any impacts from roading on designated cultural heritage values.

Advising other relevant road authorities of proposed haulage routes and any increase in traffic volume will assist them in managing impacts on roads under their management.

2.4.2 Road Design

Good road design is vital to minimise construction and maintenance costs, reduce environmental risk such as impacts to water quality, improve efficiency of haulage operations, and ensure public safety is maintained. It is important when designing a new road or improvements to an existing road that water is moved off the road into undisturbed vegetation to reduce the velocity (and hence erosivity) of water, and to provide the greatest possible infiltration of water into soil to trap sediments before discharge into waterways.

Road design includes the consideration of road location, road use, traffic volume, aspect, soil type, slope, topography, surface materials, road shape as well as road drainage and other infrastructure including culverts, drains, batters, bridges and fords.

Operational Goal

New or upgraded roads are designed to a standard capable of carrying anticipated traffic with reasonable safety, and ensuring the protection of water quality and river health, biodiversity conservation values, and Aboriginal cultural heritage.

Mandatory Actions

Stream crossings must be designed according to traffic requirements and the nature, size and period of flow (both pre and anticipated post harvest) and characteristics of the bed and banks of the stream.

Appropriate drainage must be provided. Spacing of drainage outlets along a road must take into account the soil erodibility, rainfall frequency and intensity, and the proximity of the road to streams.

Energy dissipating structures or silt traps must be used where necessary to reduce water velocity and trap sediment.

Drainage onto exposed erodible soil or over fill slopes must be avoided where possible. Structures and earthworks required to avoid such discharges are to be identified during planning and construction as required.

Stream crossings must be appropriately designed to minimise barriers to the passage of fish and other aquatic fauna.

Adequate drainage structures must be placed approximately 20 metres from permanent or temporary streams, to allow discharge onto undisturbed vegetation and to maximise the flow distance between the drainage outlet and the waterway.

Within 20 metres of a permanent or temporary stream, a road must wherever possible be drained into undisturbed vegetation using crowning or cross fall techniques. Where this is not possible, drainage must not enter directly into a permanent or temporary stream without passing through an appropriate sediment control structure such as a sediment pond or silt trap.

Gravel surfacing with a low sediment generating potential must be applied to the road area on bridge approaches (within 20 metres) and on unsurfaced bridges or culverts, when crossing permanent or temporary streams.

Guidance

On steep slopes (greater than 20 degrees), engineering advice will assist in minimising risk of road failure.

Road design should seek to increase the frequency of road drainage where the risk of soil entering waterways is high, particularly in areas where the road is closest to waterways.

Where there are extended steep approaches to waterways, extending the length of gravel surfacing may be required.

Drainage design should maximise the use of discharging water to vegetated areas, as these areas generally have a very high permeability in forests. Sediment from operational roads is dominated by fine suspended material, therefore infiltration into soil is one of the most effective remedial strategies in forests.

In areas with highly erodible sub-soils, rock lining of table drains can reduce sediment generation and delivery to streams.

To avoid turbid water discharge into waterways, energy dissipating structures, silt traps or other protective measures may also be put in place to discharge into undisturbed vegetation.

Where possible, stream crossings should be adequately elevated and low approaches maintained such that water drains away from the crossing point and is discharged into vegetated areas rather than flowing directly down the crossing to the stream channel.

Roads may be designed and managed in accordance with:
- Road Management Plans prepared under the *Road Management Act 2004;*
- VicRoads Road and Bridge Design Manuals;
- *Review of road classifications, geometric designs and maintenance standards for low volume roads* (Giummarra 2001);
- *Guidelines for assessment of applications for Permits and Licences for works on waterways* (Sinclair Knight Merz 2001);
- *Unsealed roads manual: Guidelines to good practice: a comprehensive manual prepared by the Australian Roads Research Board* (ARRB 2000); and
- *Fish Passage Requirements for Waterways Crossings* (NSW Fisheries 2004).

Bridges should be designed in accordance with AS5100 (2004) *Bridge Design*.

2.4.3 Road Construction

Mandatory Actions

Road construction must be conducted in a manner consistent with plans and designed to ensure fitness for use, public safety, the protection of water quality and river health, Aboriginal and other significant cultural heritage and biodiversity conservation values.

All fill disposal areas and embankments must be planned and designed to minimise soil erosion, mass soil movement, and potential water quality deterioration. They must be appropriately stabilised. Where revegetation is used to stabilise fills or embankments, the species must be suitable for the site and where possible indigenous to the area.

Erosion and sediment control must be an ongoing activity over the duration of the construction activity, integrated with the works schedule. Road construction sites must have erosion mitigation measures in place and appropriate temporary drainage to ensure that the site is left protected between construction activities.

Quarry materials infected with *Phytophthora cinnamomi* must not be used.

Road construction operations must ensure that:
- disturbance to stream beds and banks is kept to a minimum;
- soil and rock fill is not pushed into streams, nor placed into a position where there is a risk that it can erode into a stream; and
- cement, raw concrete, soil fill and other road making materials are not spilt into watercourses during any construction.

Legal Requirements

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any cultural heritage management plans prepared under the *Aboriginal Heritage Act 2006*.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant Regulations and Codes of Practice prepared under that Act.

All quarries, gravel and borrow pits must be in accordance with the *Extractive Industries Development Act 1995* and the *Catchment and Land Protection Act 1994* and any associated regulations.

Guidance
Permanent road and temporary road construction should be conducted when rainfall and soil conditions minimise the risk of erosion and potential offsite impact on water quality.

Stabilisation may be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Additional information can be found in the *Unsealed roads manual: Guidelines to good practice* (ARRB 2000).

Erosion from road construction sites is often dominated by coarse sediments. The use of sediment traps and ponds, followed by discharge into a vegetated area, may provide appropriate treatment to ensure that water quality is not affected.

Traffic management should be in accordance with AS 1742.3–2002 'Traffic control devices for works on roads' and the *Code of Practice for Worksite Safety – Traffic Management*.

2.4.4 Road Maintenance

Mandatory Actions
Road maintenance must be undertaken to minimise erosion and to protect water quality.

Road drainage systems must be maintained to minimise erosion and the discharge of sediment into waterways.

Blading-off is only permitted where measures are in place to prevent potential adverse impacts on water quality and where effective side drainage can be maintained.

2.4.5 Suspension of Cartage

Cartage on forest roads when wet weather or other adverse conditions affect the road surface and drainage can compromise water quality and public safety. Cartage operations may need to cease for a period where this is the case.

Mandatory Actions
Roads must be temporarily closed to heavy timber harvesting traffic when persistent wet weather or road stability compromise road drainage and water quality.

Roads must be temporarily closed to heavy timber harvesting traffic when persistent dry weather causes the surface materials to unravel to a degree that poses a threat to water quality, in the absence of suitable preventative or remedial actions to manage the risk to water quality.

Guidance
Central tyre inflation (wet weather), road watering/rolling (dry weather), gravelling and metalling, and other technology may extend the window for operational compliance with the Code.

Upgrading stream crossings (such as road surfacing or additional drainage) to protect water quality can reduce water pollution hazard due to road usage in sub-optimal periods.

2.4.6 Road Closure

Mandatory Actions

Roads no longer required for timber harvesting or other purposes, such as fire management, must be permanently closed and effectively drained.

Legal Requirements

Seasonal, temporary and permanent road closures must be implemented in accordance with Section 21a of the *Forest Act 1958* and the *Country Fire Authority Act 1958* as applicable.

Guidance

Stabilisation of closed roads can be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Section 2.3.1 of this Code covers appropriate regeneration activities.

2.5 Timber Harvesting

Timber harvesting in State forest is conducted in accordance with an approved Forest Coupe Plan (Section 2.1.3).

Operational Goals

Timber harvesting is conducted in a manner appropriate to the site, and manages the impact on soil, water and other values, including biodiversity and cultural heritage.

During or following wet weather conditions, timber harvesting operations are modified or where necessary suspended to minimise risks to soil and water quality values.

2.5.1 Coupe Planning

Mandatory Actions

Timber must only be felled from within the designated boundaries of an approved coupe as indicated on the Forest Coupe Plan and (where required) marked in the field. The Forest Coupe Plan will indicate the areas within the coupe that are not available for harvesting where this is applicable.

Timber must not be directed to fall outside the coupe boundary unless the operator is specifically authorised otherwise and the reason for authorisation is documented.

Timber harvesting operations are not permitted in special protection zones (buffers, habitat protection etc.) or other excluded areas identified on the coupe plan unless harvesting has been authorised and documented for:

- protection of public and worker safety or forest health; or
- the construction of roads or stream crossings.

Legal Requirements

All timber harvesting must comply with the requirements of the *Sustainable Forests (Timber Harvesting) Regulations 2006*.

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any cultural heritage management plans prepared under the *Aboriginal Heritage Act 2006*.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

Guidance

Notification of adjoining landholders and other regular road users that may be affected by timber harvesting operations may assist in the early resolution of any disputes.

Consideration should be given to the EPA publication *Interim Guidelines for Control of Noise from Industry in Country Victoria* (or any subsequent document).

2.5.2 Coupe Infrastructure

Coupe infrastructure includes log landings and dumps, snigging and forwarding tracks. These are the responsibility of industry to construct, maintain and rehabilitate.

Mandatory Actions

The area of coupe infrastructure required to meet timber production needs must be minimised without compromising safety. In-coupe infrastructure must be located, constructed and maintained to minimise potential adverse impacts on soil and water quality, and Aboriginal cultural heritage.

Log landings and dumps must not be located within areas excluded from harvesting unless approval from an Authorised Officer is received and noted on the Forest Coupe Plan.

Landing construction must include stockpiling of any existing topsoil for later use in rehabilitation, unless using suitable soil protection techniques (such as cording and matting).

Infrastructure must be rehabilitated on completion of operations, where not required for future operations, using rehabilitation techniques that provide suitable soil conditions for the regeneration and growth of vegetation existing on the site prior to harvesting. Refer to Section 2.3 of this Code.

Progressive rehabilitation of infrastructure during harvesting operations must be undertaken where operationally possible.

Rutting and compaction must be minimised by use of appropriate snigging/forwarding equipment or by appropriate harvesting methods.

Snigging and forwarding track location must minimise the potential for adverse impact on soil and water quality and maintain effective drainage to prevent soil erosion. Snigging and forwarding tracks must be placed at the greatest practicable distance from buffers and filter strips, without compromising operator safety.

Snigging and forwarding tracks must not be bladed off where this would result in an adverse impact on water quality or the loss of topsoil from the site. An Authorised Officer must approve any blading off of snigging and forwarding tracks.

Rehabilitation of coupe infrastructure must be assessed within three years of initial treatment and, where found inadequate, remedial action must be taken.

Cross-drains, where used, must be spaced and angled according to local prescriptions (where these exist) for soil erosion hazard class, to prevent surface run-off and subsequent discharge of turbid water into streams or drainage lines.

Guidance

Rutting and compaction may be minimised by use of cording or matting of snig tracks and/or landings.

Location and alignment of snig tracks and forwarding tracks should ensure that they can be effectively cross-drained and out-sloped, where required.

Rehabilitating coupe infrastructure at the earliest possible opportunity, including while other parts of the coupe may be operational, will reduce risks to water quality.

Appropriate drainage of snig tracks may include out-sloping, cross-draining or placement of slash to interrupt surface water flow and disperse it onto undisturbed or uncompacted areas.

Tracks designed with minimal slope and appropriate cross-fall will assist drainage. Preference should be given to uphill snigging using spurs and ridge tops, where possible.

2.5.3 Operational Restrictions

Mandatory Actions

Timber harvesting operations that involve machine traffic must be suspended when significant rutting is likely to be caused by machine traffic, unless actions are taken to reduce that risk.

Timber harvesting operations must be suspended when water begins to flow along tracks, threatening stream water quality or soil values, unless appropriate remedial actions are taken to protect those values.

Landing operations must be suspended when continuation would result in significant deterioration of the landing surface such as soil mixing and compaction.

Timber harvesting must be suspended when requested to do so by an Authorised Officer.

Legal Requirements

The *Code of Practice for Fire Management on Public Land (2006)*, the *Forests Act 1958* and the *Country Fire Authority Act 1958* may limit harvesting operations due to risk of fire danger.

Guidance

Where weather patterns and soil type create unsuitable working conditions, consideration should be given to seasonal or temporary closure of the forest to timber harvesting if appropriate remedial actions are not available or not able to be implemented to protect soil and water values.

Remedial action would include such activities as the use of cording and matting (or slashing), which can reduce the risk of soil erosion and water quality impacts in periods of wet weather.

2.5.4 Safety

Operational Goal

All operations are conducted in a manner that meets all safety and duty of care requirements.

Legal Requirements

Operations must comply with the requirements of the *Occupational Health and Safety Act 2004*, regulations made under that Act and any relevant Compliance Codes.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant Regulations and Codes of Practice prepared under that Act.

The *Safety on Public Land Act 2004* provides for the Secretary of the Department of Sustainability and Environment to declare public safety zones, restricting access to nominated areas for a specified reason.

Chapter 3

Application of the Code – Private Native Forests

3

This Section applies to all timber production activities (planning, regenerating, tending, harvesting and roading) for native forests on private land. Private native forest landowners need to consider potential impacts on water quality, aquatic habitat, biodiversity, Aboriginal heritage places and visual amenity when managing native forest for timber production.

3.1 Forest Planning

Proper planning is critical to achieving timber production requirements and the environmental outcomes encompassed by the Code. Forest management planning provides clear documentation of intended reservation of areas, measures to protect the environment and proposed forestry operations.

Under the requirements of planning schemes, timber production on private land must comply with the Code. Local government (the responsible authority) is required to consider the Operational Goals and Mandatory Actions in this Code when issuing permits for timber production activities.

Operational Goals

Forest management operations are planned and conducted in accordance with all relevant Commonwealth and State legislation, regulations, government policies and local government regulations.

Approval for timber production activities in native forest on private land is obtained through the relevant planning scheme.

Aboriginal cultural heritage values are identified, protected and managed in accordance with relevant State and/or Commonwealth legislation, with Traditional Owners and any other relevant Aboriginal groups actively engaged in the process.

Sites and places of conservation and non-Aboriginal cultural heritage significance are protected as required by law.

3.1.1 Timber Harvesting Plan

A Timber Harvesting Plan is the basic record of the forest manager's intended activities in an area of forest. It applies to a single coupe, a number of coupes or to an area in which a number of coupes are to be harvested. It assists forest operators, forest managers and local government in understanding and assessing:

- area to be harvested and operational requirements;
- compliance with the operational goals and mandatory actions of this Code;
- compliance with the planning scheme requirements; and
- compliance with relevant legislation.

Operational Goal

A Timber Harvesting Plan is prepared in accordance with the requirements of this Code and submitted to the relevant local government prior to the commencement of harvesting operations.

Mandatory Actions

A Timber Harvesting Plan must be prepared and submitted to the local government not less than 28 days prior to the commencement of operations for harvesting of native forests.

The 28 day minimum lodgement time may be waived with the agreement of the local government.

A Timber Harvesting Plan is current for 24 months following lodgement with the local government.

When preparing a Timber Harvesting Plan, the following issues must be addressed:
- methods to minimise impacts on biodiversity, water quality and river health from the operation and associated roads; and
- ways to minimise impacts on significant visual landscape values and cultural heritage values.

The Timber Harvesting Plan must include:
- estimated timber volumes to be harvested;
- the proposed haulage route;
- a map showing:
  - the coupe location(s)
  - the area(s) to be harvested
  - exclusion zones within the coupe boundary, including areas reserved or specifically managed for biodiversity conservation, waterway protection (including any buffers or filter strips), or protection of Aboriginal cultural heritage
  - powerlines
  - new or upgraded roads and coupe infrastructure within the property
- conditions applying to the operation;
- fire protection measures;
- the period during which the operation is to occur; and
- a regeneration program to follow harvesting, where required.

The size of clear-felled, seed tree or shelterwood coupes should generally not exceed 40 hectares net harvested area. Coupes may be aggregated but not exceed 120 hectares net harvested area over a period of up to five years. Aggregated coupes must not be contiguous (forming a coupe greater than 120 hectares within a five year period).

Thinning coupes must not exceed 120 hectares net harvested area. Single tree selection coupes may be of any size, where landscape or environmental values are not affected.

Coupe boundaries must take advantage of topographic and/or artificial features (such as roads and property boundaries) where they exist, with due regard to safety, operational requirements, landscape values and environmental values. Where coupe boundaries do not follow obvious natural or artificial features, they must be clearly marked on site.

Boundaries must be identified in the field.

Characteristics of coupes for salvage of timber in forests damaged by fire, pests, pathogens or other events may differ from undamaged forests. A special salvage plan or an amended Timber Harvesting Plan must be developed, taking into account:
- the need for urgency in timber recovery; and
- the need to modify prescriptions, as required, to meet environmental care goals and address recovery strategies for other forest values such as fauna.

Salvage harvesting must take as much account of environmental care as any other harvesting operation.

A copy of the Timber Harvesting Plan and any supporting prescriptions must be provided to the Harvesting Team Leader. The Plan's implementation, including specific prescriptions to be applied to the coupe, must be discussed with him/her. These documents must be available on site while operations are in progress. Amendments made to the Timber Harvesting Plan during the operation must be noted on the Plan and dated by the Harvesting Team Leader.

Chapter 3

Application of the Code – Private Native Forests

Private native forest harvesting must be carried out in accordance with *Victoria's Native Vegetation Management – A Framework for Action* (2002), an incorporated document in the VPPs and all planning schemes. Under this Framework, timber harvesting may not be allowed in forests that are considered to have high or very high conservation significance (unless harvesting is currently allowed on public land within the same bioregion for areas of vegetation which have equivalent conservation values).

Legal Requirements

A planning permit is required from Local Government for timber harvesting operations on private land. The planning permit must be approved prior to operations commencing.

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal cultural heritage management plan, undertaken in collaboration with Traditional Owners and any other relevant Aboriginal groups, may be required.

There may be requirements for protecting or minimising the impacts on water availability set out in the *Water Act 1989* or *Catchment and Land Protection Act 1994*. These may be reflected in Regional Catchment Strategies and regional River Health Strategies prepared by the relevant Catchment Management Authority, or planning schemes prepared by the local government.

The local government may place additional requirements on the Timber Harvesting Plan to meet local planning objectives.

Guidance

Local government may accept the lodgement of an annual Timber Harvesting Plan rather than Timber Harvesting Plans for individual coupes if it is satisfied that the annual Timber Harvesting Plan adequately covers the information required for all coupes included in the Plan.

The Timber Harvesting Plan may additionally include information on:

- the period(s) during which operations are to occur;
- methods of marking;
- soil erosion hazard class (or classes) of the coupe area and associated operational restrictions (e.g. slope);
- the harvesting and regeneration systems to be employed;
- areas within or adjacent to a coupe that are to be excluded from harvesting, or to which special prescriptions apply (eg. biodiversity protection or habitat enhancement, landscape protection, or Aboriginal cultural places) and details of any special conditions or prescriptions appropriate to protecting those sites;
- measures to be employed to protect and rehabilitate soils and to ensure maintenance of water quality;
- location, design, construction, maintenance and closure of log extraction roads;
- location and methods of rehabilitation of log landings and dumps and, where necessary, siting and rehabilitation measures for major snig tracks;
- seasonal restrictions; and
- any required vegetation offsets.

The location and design of the coupe should take account of the type of harvesting equipment to be used.

The Timber Harvesting Plan may include consideration of any objectives of regional River Health Strategies, Sustainable Water Strategies or any water quality plans prepared by the Catchment Management Authority or Water Authorities.

Maintaining an appropriate age class distribution will protect water availability, utilising techniques such as the adoption of longer rotations, limitations on annual harvest areas, controlling stand density by thinning to maintain streamflow, or other techniques as research knowledge becomes available. In determining which techniques may be appropriate to protect water availability in any area, consideration should be given to the forest types and age classes present, and existing water yields.

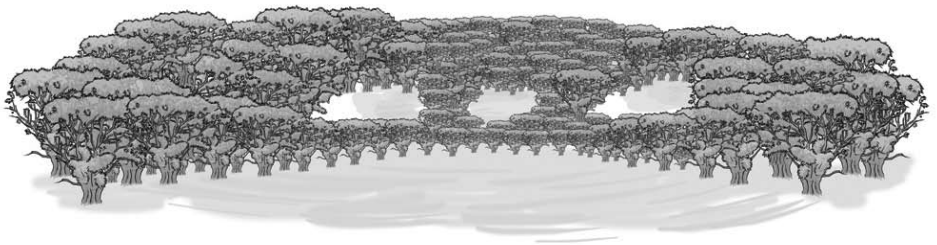
Local government and other government authorities (eg Catchment Management Authorities) may provide advisory information to assist landowners develop and implement plans to protect forest values identified as important at the catchment level.

Adverse visual impact can be minimised by appropriate modification of coupe design and distribution. The objective is to blend harvesting scenes with natural features of the landscape and particularly to minimise skyline impact (Figure 2).

Figure 2: Minimising visual impact

Small curvilinear-shaped coupes create less dominant visual impact as they blend with the natural landscape.

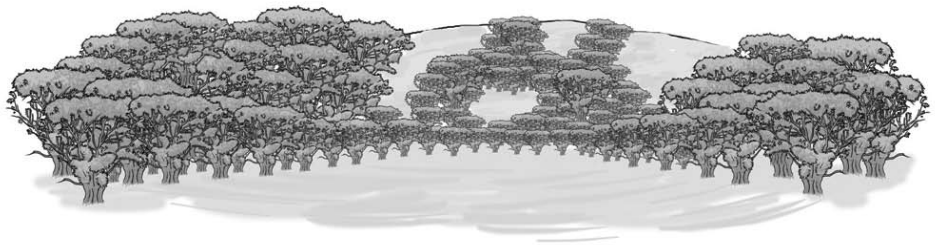
Sequencing of harvest operations over time reduces their visual impact.



To be encouraged.

Large geometrically-shaped harvest areas create unsightly contrasts with the natural forms and lines of the landscape.

Harvest areas which breach the horizon create unsightly skyline impacts.



To be avoided.

3.2 Environmental Values in Private Native Forests

Timber production operations in private native forests may impact on environmental values such as water quality and biodiversity. Appropriate planning and management through the lifecycle of the operation can minimise these impacts. This section includes requirements that must be observed during planning, tending, roading and harvesting of native forests on private land.

3.2.1 Water Quality, River Health and Soil Protection

The Code defines three classes of waterway in Victoria:
1. Permanent rivers and streams, pools and wetlands;
2. Temporary streams; and
3. Drainage lines.

Definitions and aids to the identification of each class of waterway are provided in the Glossary. The classification of a waterway is based on its characteristics prior to harvesting, noting that stream flow may change following harvesting.

Operational Goals

Water quality and river health are maintained or improved by protecting waterways from disturbance.

Soil erosion and water pollution are minimised by avoiding harvesting in inappropriate areas or slopes and undertaking necessary preventative measures.

Mandatory Actions

Storage, use and disposal of petroleum products and machinery servicing must not pollute the environment nor result in littering. Waste oil, all empty drums, discarded machinery parts and other waste must be removed from the forest and taken to an approved disposal facility. Toilet wastes must not be allowed to enter a waterway.

Crossing of waterways must be minimised. Approved crossings must be designated on the Timber Harvesting Plan. Where crossings involve the use of log culverts, these must be removed when harvesting (including any regeneration activities) is completed. When removing crossings, techniques that minimise soil disturbance must be used.

Waterways within and immediately adjacent to each coupe must be classified using the waterway classification system described above.

Water quality and river health must be protected by maintaining buffers and/or filter strips (to each side of the waterway) of not less than the widths specified in Table 3.

Buffers and filter strips must be specified on the basis of field risk assessments, and the outcomes shown on the Timber Harvesting Plan.

The location of buffers and filter strips must be easily distinguishable in the field, either through the use of obvious geographic features or marking.

Table 3 Minimum width in metres for buffer strips (B) and filter strips (F) to be applied to various waterway categories, in relation to water quality risk and slope.

	Sites with low or moderate water quality risk	Sites with high or very high water quality risk	
Waterway Class	*Slope 0–30°*	*Slope 0–20°*	*Slope 21°–30°*
1. Pools, permanent streams and wetlands	20m B	30m B	40m B
2. Temporary streams	10m F	10m B	20m B
3. Drainage lines	10m F	10m F	15m F

Notes: Slope is the average slope of the coupe area in the vicinity of the water body.

Buffers and filter strips must be applied to each waterway class regardless of the origins of the channelling.

The width of buffer areas and filter strips must be measured in the horizontal plane, from the edge of the saturated zone (at time of harvesting) or channel (whichever is greater), on each side of the waterway.

The potential risk to water quality is determined through consideration of:
- soil erodibility;
- soil permeability;
- rainfall erosivity (including season of operation);
- topography;
- type of operation; and
- location of coupe infrastructure.

Additional measures to protect water quality and aquatic habitat (including widening buffers or filter strips) must be adopted within coupes where there is a high local risk due to:
- local topography;
- the intensity and magnitude of the harvesting operation; or
- the location of the operation in a declared Special Water Supply Catchment area or water supply protection area.

Where fire is used in forestry operations, all practicable measures must be taken to protect buffers and filter strips from the effects of fire.

For operations within buffer areas

Trees must not be felled from within buffer areas unless the selective removal of trees is required for safety purposes and noted on the Timber Harvesting Plan.

Buffers must be protected from damage caused by trees felled in adjacent areas. Trees accidentally felled into buffers may be removed only if significant damage and disturbance of soil and vegetation in the buffer can be avoided.

Machinery must not enter a buffer area except for the construction and use of stream crossings as specified in the Timber Harvesting Plan.

Pushing of fill or harvesting debris into a buffer or construction of drain structures within a buffer is not permitted except for the construction of an approved stream crossing.

For operations within filter strips

Trees may be felled from within filter strips. The felling of trees into filter strips must be avoided where possible.

Disturbance to soil and understorey vegetation from harvesting operations in filter strips must be minimised.

Machinery must not enter a filter strip, except at stream crossings as specified in the Timber Harvesting Plan.

Pushing of fill or harvesting debris into a filter strip is not permitted except for the construction of an approved stream crossing.

Where temporary or log culverts are used, they must be removed immediately after harvesting or any subsequent regeneration work for which they are required, using a technique that minimises soil disturbance.

Operations on steep slopes

Timber harvesting must not occur on slopes where the operation cannot be conducted safely, threatens the stability of the soil or has high potential for adverse off-site effects. The potential for mass soil movement must be assessed and necessary preventative actions undertaken.

Harvesting operations using ground-based machinery must be excluded from slopes greater than 30 degrees. Small areas within coupes (of less than 10 per cent of the net harvested area) that are greater than 30 degrees may be harvested where the land is assessed as capable of supporting activities without risk of soil movement.

Cable logging techniques may be used on all steep slopes (exceeding 30 degrees) where the area is assessed as being capable of supporting harvesting activities without risk of soil movement.

On slopes with a high soil erosion hazard or where there is an assessed risk of mass soil movement, additional measures must be taken to avoid movement of soil into streams, such as modification to harvesting methods or increasing of the widths of buffers and filter strips.

Legal Requirements

Measures to reduce the impact of timber harvesting on water quality and river health must take account of other requirements set out in Special Area Plans made under the *Catchment and Land Protection Act 1994*. Any particular requirements to increase buffers due to the location of a water supply off-take point or any other relevant requirements set out in Special Area Plans, must be observed.

Guidance

Directing trees to fall out of filter strips may reduce soil disturbance.

Logging techniques specifically designed for steep slopes (such as cable logging) may be used to minimise soil movement.

The additional protection measures applied to protect waterways may include additional buffers and filter strips, or modified harvesting within parts of a coupe.

There are appropriate Australian Standards for the storage and handling of fuels, such as AS1940, that provide detailed practical guidance to minimise the risk of fuel spills.

There may be other special requirements for water quality and soil protection set out in a regional River Health Strategy, or a Water Quality Plan prepared by the relevant Catchment Management Authority or Melbourne Water. These plans may provide guidance on additional protection measures.

3.2.2 Conservation of Biodiversity

Operational Goal

Planning, harvesting and silvicultural operations in private native forests specifically address the conservation of biodiversity, in accordance with relevant legislation and regulations, and considering relevant scientific knowledge.

Mandatory Actions

Where fire is used in timber production operations, all practicable measures must be taken to protect all areas excluded from harvesting from the impacts of unplanned fire.

Rainforest communities in Victoria must not be harvested. Rainforest communities must be protected from the impacts of harvesting through the use of appropriate buffers to maintain microclimatic conditions and protect from disease and other disturbance.

Legal Requirements

The *Catchment and Land Protection Act 1994* requires all landholders to control pest animals and noxious weeds on their property.

The *Environment Protection and Biodiversity Conservation Act 1999* includes provisions to protect matters of national environmental significance, including listed threatened species and endangered ecological communities.

The *Wildlife Act 1975* contains provisions to protect wildlife and includes requirements relating to control of wildlife species causing damage.

Planning approval is required to remove native vegetation (Clause 52.17 of planning schemes) and planning schemes may also contain additional requirements for the protection of biodiversity. The Native Vegetation Management Framework outlines areas of high or very high conservation forest that must be protected. Timber harvesting may not be allowed in forests that are considered to have high or very high conservation significance (unless harvesting is currently allowed on public land within the same bioregion for areas of vegetation which have equivalent conservation values).

Guidance

The objective of habitat retention measures is to facilitate the continued occupation or recolonisation by all species that are likely to have occurred in the area prior to timber harvesting. Thus, no part of the harvested area will become permanently unsuitable for any species likely to have been resident or a regular visitor to the stand before it was harvested.

Opportunities to improve the protection of threatened species or habitat values may include reserving further strategic areas from harvesting, or modifying harvesting and silvicultural techniques to achieve specific conservation objectives.

Where vegetation is retained, consideration should be given to both the protection of retained vegetation during harvesting and subsequent management, and the effect of retained vegetation on the growth of future crop trees.

Streamside buffers may both protect water quality and act as a wildlife corridor. However, the need for corridors along or across other topographic features may arise and should be considered in relation to the forest type and fauna present.

When planning and undertaking regeneration burning operations, minimising slash near any retained vegetation (eg. buffer strips, habitat trees, seed trees or patches or shelterwood one trees) will assist with its survival.

The following approaches should be considered to facilitate protection of biodiversity values:

- application of protection measures specified in relevant *Flora and Fauna Guarantee Act* Action Statements, as applicable to private land;
- use of wildlife corridors, comprised of appropriate widths of retained forest, to facilitate fauna movement between patches of forest of varying ages and stages of development;
- retention of habitat trees or patches and long-lived understorey elements in appropriate numbers and configurations, and provision for replacement of old hollow-bearing trees within or around coupes. Consideration should be given to both the protection of habitat trees during harvesting and subsequent management, and the effect of retained trees on the growth of future crop trees;
- providing appropriate undisturbed buffer areas around identified significant habitats; and
- modifying coupe size and dispersal in the landscape, and rotation periods, where possible and as appropriate.

Local government and the Department of Sustainability and Environment may provide further information to assist private land managers to conserve biodiversity during the development of Timber Harvesting Plans.

3.3 Forest Regeneration and Management

This section covers the regeneration of private native forest and the subsequent management of such stands, where required. Unless required for another authorised purpose, private native forests in Victoria are to be successfully regenerated to approximate the original forest composition.

3.3.1 Regeneration

Operational Goals

Harvested private native forest is managed to ensure that the forest is regenerated and that the biodiversity of the native forest is perpetuated.

The natural floristic composition and representative gene pools are maintained when regenerating native forests by using appropriate seed sources and mixes of dominant species.

Mandatory Actions

Action must be taken to secure the regeneration of harvested coupes, except where:

- the land is to be used for an authorised/approved purpose for which native vegetation is not compatible (for example, authorised/approved services and infrastructure, and structures);
- timber has been harvested by thinning a stand; or
- the stocking of seedlings or regrowth is assessed as sufficient through natural regeneration processes.

Silvicultural methods for regeneration must be appropriate to the forest type and local conditions.

Where fire is used in regeneration operations, all practicable measures must be taken to protect all areas excluded from harvesting.

Private native forest must be regenerated following timber harvesting, with species native to the area, wherever possible using the same provenances, or if not available, from an ecologically similar locality.

Except where past management practices may have altered species composition, regeneration operations must aim to approximate the composition and spatial distribution of canopy species common to the coupe prior to harvesting, where they can be determined.

Where mechanical disturbance is used, it must be undertaken with due consideration of erosion risk potential and the proximity of waterways (refer to Section 3.2).

Action must be taken to ensure that any Aboriginal cultural heritage places located within harvested coupe areas are appropriately protected and managed during regeneration activities.

Regeneration of private native forests must be in accordance with the planning scheme and the relevant incorporated document, *Victoria's Native Vegetation Management – A Framework for Action* (2002).

Legal Requirements

Use of pesticides in site preparation and/or seedling or regrowth/advanced growth liberation must comply with Commonwealth and State legislation and regulations.

Under the *Wildlife Act 1975*, browsing native animals that threaten regeneration may only be controlled under permits and in accordance with any associated conditions as issued by relevant authorities.

Use of fire must be in accordance with the *Country Fire Authority Act 1958* and any associated regulations, planning provisions and any planning permit conditions.

Guidance

The regeneration of understorey species should be facilitated where possible. Harvesting and regeneration methods that provide appropriate disturbance to understorey elements to ensure their ongoing survival or protect understorey patches may assist in regenerating this component of the forest structure.

DSE maintains guidelines and standards against which regeneration may be assessed, that may provide a useful reference for forest managers and operators.

Where natural seedfall or artificial sowing is used, surveys may be conducted to assess the quality of the seedbed before seed is applied.

A receptive seedbed for regeneration may be achieved by burning of harvest debris, or by mechanical disturbance either as part of timber harvesting operations or following operations.

Burning of debris may reduce the fire hazard associated with large accumulations of flammable material and promote the regeneration of fire dependent species. However, it may also affect the regeneration of fire sensitive species. Mechanical disturbance may have impacts on soil or water quality values and the regeneration of some species.

An ecologically similar locality for a species is from a similar elevation, aspect, soil type and/or climate, preferably as close as possible to the harvested area. Genetic testing may assist in determining similarity.

The careful screening or treatment of seed and nursery stock used in regeneration will minimise the spread of weeds, pathogens or pests.

Where seed is used, the source of seed may be noted on the Timber Harvesting Plan.

3.3.2 Stocking Assessment and Remedial Treatment

Operational Goal

Stocking and early seedling growth is monitored and remedial action is taken where necessary to successfully regenerate harvested areas of native forests.

Mandatory Actions

Stocking on harvested coupes must be assessed within three years of treatment, to determine whether regeneration has been successfully achieved and to ensure that re-treatment occurs where necessary.

Where stocking, health or early growth is inadequate, remedial work must be conducted as soon as practicable to obtain adequate regeneration. Further assessment must be undertaken following remedial treatment.

The results of assessment must be recorded for future reference.

Legal Requirements

Victoria's Native Vegetation Management – A Framework for Action indicates required regeneration quality standards for clear-fell and selective harvesting operations.

For clear-fell operations, regeneration is to be managed so that it has the best opportunity to reach a target of 50 per cent of the quality of the vegetation that was harvested within 10 years and ultimately the same quality (minus the large tree component).

For selective harvesting, the reduction in quality in a site must not be greater than the percentage specified in the Regional Native Vegetation Plans.

Guidance
Where selection (uneven-aged) silvicultural systems are used, stocking assessments should take account of retained trees and their impact on the health and vigour of regrowth.

DSE has publicly available standards for the assessment of regeneration for various forest types and silvicultural systems. Private forestry operators may consider these for application on private land.

The results of assessments and details of any further silvicultural treatments may be recorded on Timber Harvesting Plans.

3.3.3 Tending

Tending includes stand improvement (such as overwood removal or reduction), timber harvesting including thinning and salvage felling, fertilising, and other silvicultural practices to promote stand health and timber production. Appropriate action may be taken to tend native timber production stands where consistent with environmental safeguards and offsite impacts are minimised.

Operational Goal
The productive capacity and other values of the forest are maintained or enhanced by appropriate tending of stands.

Mandatory Actions
Tending operations must be planned and conducted in a manner that minimises adverse impacts on areas that are excluded from harvesting.

Legal Requirements
Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the land owner to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

The use of chemicals for stem injection must be in accordance with relevant Commonwealth and State legislation, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994*, the *Agricultural and Veterinary Chemical (Control of Use) Act 1992* and associated regulations.

Guidance
DSE has publicly available standards for undertaking thinning in various forest types, which private forestry operators may wish to adopt.

3.3.4 Forest Health

Forest health is important to maintain to ensure the long-term ecological integrity and productivity of Victoria forests. Forest health can be promoted through stand management practices (such as fire application, timber harvesting including salvage felling and thinning, weed, pest and pathogen control), where issues are detected. For some activities, a permit from relevant planning authorities may be required.

Operational Goals
Forest health is monitored and maintained by employing appropriate preventative, protective and remedial measures.

Chemicals are used only where this is appropriate to the site conditions and with care for the maintenance of water quality, biodiversity and soil values.

Mandatory Actions

Chemical use must be appropriate to the circumstances and conducted with due consideration of the maintenance of biodiversity, water and soil quality.

When applying chemicals in declared Special Water Supply Catchment Areas, the relevant Water Authority must be notified prior to application.

If the introduction of a new or unknown exotic agent is suspected, Biosecurity Victoria must be informed.

Where there is a known risk of introducing pest plants, pest animals and pathogens to the forest (for example, but not limited to *Armillaria* or *Phytophthora*), precautions must be taken and the risk minimised through appropriate treatment of equipment when moving from known infested areas.

Where Myrtle Wilt fungus (*Chalara australis*) is known to exist, precautionary measures must be applied to minimise the spread of this pathogen.

Legal Requirements

The use of chemicals for control of pests and pathogens must be in accordance with relevant Commonwealth and State legislation, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994* and the *Agricultural and Veterinary Chemical (Control of Use) Act 1992* and associated regulations.

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the land owner to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

Guidance

The risks posed by pest plants, pest animals and pathogens and other environmental stresses to forest health may be assessed regularly and systematically so that problems are detected early and appropriate remedial strategies are implemented. Pre-operations surveys can include soil sampling and testing for soil-borne pathogens as appropriate.

Various aspects of forest health may be monitored and documented (aided by photographic records as appropriate) in assessments, including crown and foliage condition, presence of damaging agents and description of damage levels.

Successful control or management of forest health problems may require coordinated action involving adjacent landholders and other forest owners.

Washing of machinery and equipment when moving between forest areas may assist in the control of the spread of some pathogens and weeds.

Where pesticides are used, a Pesticide Application Plan may be prepared that specifies the target pest(s), chemical(s), target area(s), application rates and method(s) and operational controls that will be adopted to minimise unintended off-target and off-site impacts. It could also address the process for any notifications required by law.

The factsheet *Herbicides: guidelines for use in and around water* prepared by the Cooperative Research Centre for Australian Weed Management provides useful guidelines for the appropriate use of herbicides to control weeds near waterways.

Guidance on control measures for Myrtle Wilt can be found in the relevant *Flora and Fauna Guarantee Act* Action Statement.

3.4 Roading for Timber Production

This section covers the planning, location, design, construction, maintenance and use of permanent and temporary roads for haulage and machinery transport. This section does not consider requirements for snigging and forwarding tracks, which are covered under coupe infrastructure (Section 3.5.1).

Timber production roads have the potential to create significant environmental impacts, particularly on water quality and river health. The aim of this Code of Practice is to protect a range of environmental values while allowing economic roading for timber production, management purposes and other uses.

Operational Goal

The planning and management of permanent and temporary roads for timber haulage and machinery transport ensures that the road is fit for intended purpose, and protects environmental and cultural values and the safety of road users.

Legal Requirements

Local Government is generally the Road Authority under the *Road Management Act 2004* responsible for municipal roads. The Road Authority must manage roads it is responsible for in accordance with the requirements of the *Road Management Act 2004* and any Regulations or Codes of Practice made under that Act.

3.4.1 Road Planning

Mandatory Actions

Road planning and design for new and substantially upgraded roads within the property must ensure the road is adequate for the intended use, while ensuring the protection of water quality and conservation values, including river health.

Road planning must:

- locate roads to minimise risks to environmental values, particularly soil, water quality and river health, during both construction and ongoing road use;
- locate roads so as to avoid and mitigate impacts on known Aboriginal cultural heritage places;
- time construction activities to minimise risks associated with unsuitable weather conditions;

Existing roads must, where practicable, be used for access to a coupe or work site and to haul timber, except where it can be clearly demonstrated that a new or relocated road provides enhanced environmental outcomes by minimising or removing existing threats to soil, water quality or biodiversity.

Plans for roads must be based on field surveys to ensure all environmentally sensitive locations are identified and appropriate design and construction techniques adopted.

Legal Requirements

Consistent with the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment, undertaken in collaboration with the relevant Traditional Owners, may be required.

Threatened species may be protected under the *Environment Protection and Biodiversity Conservation Act 1999* or the subject of an Interim Conservation Order under the *Flora and Fauna Guarantee Act 1988*.

Road planning, including approval for stream and drainage line crossings, must comply with the *Water Act 1989*, the *Catchment and Land Protection Act 1994*, the planning scheme and any conditions of planning permits (refer clause 52.18 of planning scheme regarding repair of municipal roads).

Guidance

Preparing an erosion and sediment control plan for major road construction works will assist in managing this important issue during construction.

Assessing all stream crossings on planned cartage routes and undertaking necessary upgrades will assist in minimising water quality impacts due to increased traffic volumes.

Roading running parallel and in close proximity to streams should be avoided, and stream crossings should be minimised.

Roads should where possible be located to:

- avoid steep and unstable slopes and areas prone to landslips;
- minimise disturbance to streams, buffer strips, riparian vegetation and rainforest in areas not associated with approved crossings; and
- restrict the movement of side-cast material into streams or drainage lines.

The development of an Aboriginal cultural heritage management plan, in collaboration with Traditional Owners and any other relevant Aboriginal groups, will assist in identifying and mitigating any impacts on designated cultural heritage values.

3.4.2 Road Design

When building new roads or substantially upgrading existing roads, good road design is vital for maintaining water quality. It is important to control the speed (and hence erosivity) of water, and to provide the greatest possible infiltration across vegetated ground to trap sediments before discharge into waterways.

Road design includes the consideration of road location, aspect, shape, traffic frequency, type and volume, slope, topography, surface materials, as well as road infrastructure including culverts, drains, batters, bridges and fords.

Mandatory Actions

New or upgraded roads must be designed to a standard capable of carrying anticipated traffic with reasonable safety, and ensuring the protection of water quality and river health, biodiversity conservation values, and Aboriginal cultural heritage.

Stream crossings must be designed according to the nature, size and period of flow (both pre and anticipated post harvest) and characteristics of the bed and banks of the stream.

Appropriate drainage must be provided. Spacing of drainage outlets along a road must take into account of the soil erodibility, the rainfall erosivity, and the proximity of the road to streams.

Energy dissipating structures or silt traps must be used where necessary to reduce water velocity and trap sediments.

Drainage onto exposed erodible soil or over fill slopes must be avoided where possible. Structures and earthworks required to avoid such discharges are to be identified during planning and construction as required.

Stream crossings must be appropriately designed to minimise barriers to the passage of fish and other aquatic fauna.

Legal Requirements

Stream crossings must be designed to comply with the *Water Act 1989*. Works, including stream crossings, on designated waterways require a Works on Waterways permit from the relevant Catchment Management Authority.

3

Guidance

On steep slopes (greater than 20 degrees), engineering advice will assist in minimising risk of road failure.

Road design should seek to increase the frequency of road drainage in areas where the risk of soil entering waterways is high.

Drainage design should maximise the use of discharging water to vegetated areas, as these areas generally have a very high permeability in forests. Sediment from operational roads is dominated by fine suspended material, therefore infiltration into soil is one of the most effective remedial strategies in forests.

The season of harvesting, transport needs, construction standards specified in the planning scheme (or a permit issued under the planning scheme), and the water quality values to be protected are important considerations in road design.

Placing adequate drainage structures approximately 20 metres from waterways will allow discharge onto undisturbed vegetation and maximise the flow distance between the drainage outlet and the waterway.

Additional drainage measures should be considered such as crowning or cross fall to ensure that water within 20 metres of a waterway discharges into undisturbed vegetation. Where this is not possible, drainage should not enter directly into a permanent or temporary stream without passing through an appropriate sediment control structure such as a sediment pond or silt trap.

In areas with highly erodible sub-soils, rock lining of table drains can reduce sediment generation and delivery to streams.

To avoid turbid water discharge into waterways, energy dissipating structures, silt traps or other protective measures may also be put in place to discharge into undisturbed vegetation.

Where possible, stream crossings should be adequately elevated and low approaches maintained such that water drains away from the crossing point and is discharged into vegetated areas rather than flowing directly down the crossing to the stream channel.

Placing gravel surfacing with a low sediment generating potential applied to the road area on bridge approaches (within 20 metres) and on unsurfaced bridges or culverts will assist in reducing impacts on water quality. Where there are extended steep approaches to waterways, extending the length of gravel surfacing may be required.

Roads may be designed and managed in accordance with:

- *Review of road classifications, geometric designs and maintenance standards for low volume roads* (Giummarra 2001);
- *Guidelines for assessment of applications for Permits and Licences for works on waterways* (Sinclair Knight Merz 2001);
- *Unsealed roads manual: Guidelines to good practice: a comprehensive manual prepared by the Australian Roads Research Board* (ARRB 2000); and
- *Fish Passage Requirements for Waterways Crossings* (NSW Fisheries 2004).

Bridges should be designed in accordance with AS5100 (2004) *Bridge Design.*

3.4.3 Road Construction

Mandatory Actions

Road construction must be conducted in a manner consistent with plans and designed to ensure the protection of water quality and river health, Aboriginal cultural heritage and biodiversity conservation values.

All fill disposal areas and embankments must be planned and designed to minimise soil erosion, mass soil movement, and potential water quality deterioration. They must be stabilised and rehabilitated when no longer required.

Where revegetation is used to stabilise fills or embankments, the species must be suitable for the site and task, and where possible indigenous to the area.

Erosion and sediment control must be an ongoing activity over the duration of the construction activity, integrated with the works schedule. Road construction sites must not be left unprotected between construction activities, as this constitutes an unacceptable water pollution risk.

Quarry materials must not be used if known to be infected with *Phytophthora cinnamoni.*

Construction operations must ensure that:

- disturbance to stream beds and banks is kept to a minimum;
- soil and rock fill is not pushed into streams, nor placed into a position where there is a risk that it can erode into a stream; and
- cement, raw concrete, soil fill and other road making materials are not spilt into watercourses during any construction.

Legal Requirements

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any cultural heritage management plans prepared under the *Aboriginal Heritage Act 2006.*

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006.*

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant Regulations and Codes of Practice prepared under that Act.

All quarries, gravel and borrow pits must be in accordance with the *Extractive Industries Development Act 1995*, the planning scheme, the *Catchment and Land Protection Act 1994* and any associated regulations.

Guidance

Permanent road and temporary road construction should be conducted when rainfall and soil conditions minimise the risk of erosion and potential offsite impact on water quality.

Stabilisation may be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Additional information can be found in *Unsealed roads manual: Guidelines to good practice* (ARRB 2000).

Erosion from road construction sites is often dominated by coarse sediments. The use of sediment traps and ponds, followed by discharge into a vegetated area, may provide appropriate water treatment.

Traffic management should be in accordance with AS 1742.3 (2002) 'Traffic control devices for works on roads' and the *Code of Practice for Worksite Safety – Traffic Management*.

3.4.4 Road Maintenance

Mandatory Actions
Road maintenance must be undertaken to minimise erosion and to protect water quality.

Road drainage systems must be maintained to minimise erosion and the discharge of sediment into streams and drainage lines.

Blading-off of roads is only permitted where measures are in place to prevent potential adverse impacts on water quality and where effective side drainage can be maintained.

Legal Requirements
Management of vegetation beside permanent roads that remain open must comply with the requirements of the planning scheme and the conditions of any planning permit.

Under clause 52.18 of the planning scheme forest owners or managers are responsible for restoring any municipal roads that are used as a haulage route to the same condition they were in before the start of harvesting operations, to the extent of any damage caused as a result of the timber haulage operations.

3.4.5 Suspension of Cartage

Mandatory Actions
Roads on private land must be temporarily closed to heavy timber harvesting traffic when persistent wet weather or road stability compromise road drainage and water quality.

Roads on private land must be temporarily closed to heavy timber harvesting traffic when persistent dry weather causes the surface materials to unravel to a degree that poses a threat to water quality, in the absence of suitable preventative or remedial actions to manage the risk to water quality.

Guidance
Central tyre inflation (wet weather), road watering/rolling (dry weather) and other technology may extend the window for operational compliance with the Code.

Upgrading of stream crossings (such as road surfacing or additional drainage) to protect water quality can reduce water pollution risk due to road usage in sub-optimal periods.

3.4.6 Road Closure

Mandatory Action
Roads no longer required for timber harvesting or other management purposes, including fire management, must be permanently closed and effectively drained.

Guidance
Stabilisation of closed roads can be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Section 3.3.1 of this Code covers appropriate rehabilitation activities.

3.5 Timber Harvesting

Operational Goals

Timber harvesting is conducted in a manner appropriate to the site, and manages the impact on soil, water and other values, including biodiversity and cultural heritage.

During or following wet weather conditions, timber harvesting operations are modified or where necessary suspended to minimise risks to soil and water quality values.

Mandatory Actions

Timber harvesting operations are only permitted within the designated boundaries of the coupe as indicated on the Timber Harvesting Plan and where required, marked in the field.

Timber must be directed to fall within the coupe boundary unless unsafe to do so. A decision to fall outside the coupe boundary must be documented on the Timber Harvesting Plan.

Timber harvesting operations are not permitted in excluded areas (identified on the Timber Harvesting Plan), except where the limited removal of the minimum number of trees is necessary for:

- the protection of worker safety; or
- the construction of roads or stream crossings.

Any harvesting within excluded areas must be documented on the Timber Harvesting Plan.

Legal Requirements

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any cultural heritage management plans prepared under the *Aboriginal Heritage Act 2006.*

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006.*

All timber harvesting must comply with the requirements of the planning scheme the approved Timber Harvesting Plan and the conditions of any planning permit.

Guidance

Notification of adjoining landholders that may be affected by timber harvesting operations may assist in the early resolution of any disputes.

Consideration should be given to the EPA publication *Interim Guidelines for Control of Noise from Industry in Country Victoria* (or any subsequent document).

3.5.1 Coupe Infrastructure

Coupe infrastructure includes log landings and dumps, snigging and forwarding tracks used as part of the timber harvesting operation.

Mandatory Actions

The area of coupe infrastructure must be minimised without compromising safety. Infrastructure must be located, constructed and maintained to minimise potential adverse impacts on soil and water quality, and Aboriginal cultural heritage.

Log landings and dumps must not be located within areas excluded from harvesting.

Infrastructure must be rehabilitated on completion of timber harvesting and regeneration operations, where not required for future operations, using rehabilitation techniques that provide suitable soil conditions for the regeneration and growth of vegetation existing on the site prior to harvesting. Refer to Section 3.3 of this Code. Rehabilitation for landings will involve ripping the surface of the landing, respreading any stockpiled topsoil and draining the area.

Landing construction must include stockpiling of any existing topsoil for later use in rehabilitation, unless using suitable soil protection techniques (such as cording and matting).

Rutting and compaction must be minimised by use of appropriate snigging/forwarding equipment or by appropriate harvesting methods.

Snigging and forwarding tracks must be located to minimise risk of potential adverse impact on soil and water quality, and must be placed at the greatest practicable distance from buffers and filter strips, without compromising operator safety.

Tracks must have effective drainage to prevent soil erosion. Cross-drains, where used, must be spaced and angled according to any prescriptions in planning schemes, conditions of any planning permit or other approved plan to prevent surface run-off and subsequent discharge of turbid water into streams or drainage lines.

Snigging and forwarding tracks must not be bladed off where this would result in an adverse impact on water quality or the loss of topsoil from the site.

Rehabilitation of coupe infrastructure must be assessed within three years of initial treatment and, where found inadequate, remedial action must be taken.

Guidance

Rutting and compaction may be minimised by use of cording or matting of snig tracks and/or landings.

Alignment of snig tracks and forwarding tracks should be located where they can be effectively cross-drained and out-sloped.

Rehabilitating coupe infrastructure at the earliest possible opportunity, including while other parts of the coupe may be operational, will reduce risks to water quality.

Appropriate drainage of snig tracks may include out-sloping, cross-draining or placement of slash to interrupt surface water flow and disperse it onto undisturbed or uncompacted areas. Cross-drains should be spaced and angled according to local prescriptions (where these exist) according to soil erosion hazard class.

Tracks designed with minimal slope and cross-fall will assist drainage. Preference should be given to uphill snigging using spurs and ridge tops, where possible.

3.5.2 Operational Restrictions

Mandatory Actions

Snigging and forwarding operations must be suspended when significant rutting is likely to be caused by machine traffic unless actions are taken to reduce that risk.

Snigging and forwarding operations must be suspended when water begins to flow along tracks, threatening stream water quality or soil values, unless appropriate remedial actions have been taken to protect those values.

Landing operations must be suspended when continuation would result in significant compaction or mixing or subsoil of the landing surface.

Legal Requirements
Under the *Country Fire Authority Act 1958*, harvesting may be prohibited in high fire danger periods.

Guidance
Where weather patterns and soil type create unsuitable working conditions, consideration should be given to seasonal or temporary closure of the forest to timber harvesting.

The use of cording and matting can reduce the risk of soil erosion and water quality impacts in periods of wet weather.

3.5.3 Safety

Operational Goal
All operations are conducted in a manner that meets all safety and duty of care requirements.

Legal Requirements
Operations must comply with the requirements of the *Occupational Health and Safety Act 2004*, regulations made under that Act and any relevant Compliance Codes.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant Regulations and Codes of Practice prepared under that Act.

Chapter 4

Application of the Code – Plantations

Plantations are managed stands of trees of either native or exotic species, planted or sown primarily for timber production purposes. This Chapter applies to timber production activities in all plantations, except those managed by the Department of Sustainability and Environment (which are subject to Chapter Two).

Plantation development is regulated by the Victoria Planning Provisions (VPP) and a permit is generally not required. Refer to your local planning scheme for details. The Code is an incorporated document in the VPP.

4.1 Plantation Planning and Design

Operational Goals

Plantations are designed, managed and operated in accordance with all relevant legal requirements.

Local government is appropriately informed of new plantation development by the lodgement of either a Plantation Development Notice or a planning permit, in accordance with this Code.

Sites of conservation or Aboriginal and non-Aboriginal cultural heritage significance are protected as required by law.

Mandatory Actions

Plantation design must take account of environmental values (Section 4.2), and be consistent with relevant fire protection requirements.

For new plantations where a planning permit is not required, a Plantation Development Notice must be lodged with the local government not less than 28 days prior to the commencement of site preparation. The 28 day minimum lodgement time may be waived with the agreement of the local government.

A Plantation Development Notice must include:

- the landowners name and address;
- the total area to be planted;
- species to be planted;
- year of planting; and
- a map of the plantation, showing:
  - the location of the plantation;
  - any access roads or tracks;
  - powerlines;
  - any retained native vegetation within the plantation boundaries.

Legal Requirements

Plantation establishment and management in Victoria are controlled by the planning scheme under the *Planning and Environment Act 1987*. Approval for plantation establishment, where required, must be obtained through the relevant planning scheme. Note that most plantations should not require a permit application.

Strategic firebreaks must be in place and maintained in accordance with *Country Fire Authority Act 1958* and any associated regulations, the planning scheme, or relevant conditions of any planning permit. For plantations greater than 500 hectares in size, a Forest Industry Brigade may be required.

Protection of landscape values must comply with the requirements of the planning scheme, and any local policies, as applicable. Refer to your relevant Municipal Strategic Statement.

Unless a planning permit is approved, a plantation must not be located within 100 metres of:
- any dwelling in separate ownership;
- any land zoned for residential, business or industrial use; or
- any site specified on a permit which is in force which permits a dwelling to be constructed.

The plantation must not be within 20 metres of a power line whether on private or public land, except with the consent of the relevant electricity supply or distribution authority. Tree clearing in the vicinity of powerlines is regulated by the *Electricity Safety (Network Assets) Regulations.* Non-authorised persons are prohibited from working on trees that may fall within up to 6m of network assets.

Any removal of native vegetation for plantation development must comply with the VPP and the local planning scheme, as applicable. This may require the provision of offsets, as detailed in *Victoria's Native Vegetation Management – A Framework for Action* (2002).

Sites of conservation or Aboriginal and non-Aboriginal cultural heritage significance are protected by law. Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal cultural heritage management plan, undertaken in collaboration with Traditional Owners and any other relevant Aboriginal groups, may be required.

There may be requirements for protecting or minimising the impacts on water availability set out in the *Water Act 1989* or *Catchment and Land Protection Act 1994*. These may be reflected in Regional Catchment Strategies and regional River Health Strategies prepared by the relevant Catchment Management Authority or planning schemes prepared by local government.

Guidance

Plantation design for subsequent rotations should consider environmental values (section 4.2), and be consistent with relevant fire protection requirements. Plantations may be established with any species that meet the objectives of the grower, unless the growing of that species is prohibited by the provisions of any laws or regulations.

When planning plantation establishment, consideration may need to be given to existing water yields and the level of commitment of the water resource.

Where applicable, consideration should be given to maintaining access for utility operation and maintenance vehicles to powerline assets within a plantation. Plantation planning should also consider providing appropriate setbacks from powerlines to minimise the risk of falling trees coming in contact with powerlines. Advice regarding appropriate clearances and access may be sought from the relevant distribution authority at the design phase.

The Country Fire Authority has available *Guidelines for the Management of Forest Industry Brigade Operations* (1999), which include *Guidelines for Preparing a Plantation Fire Management Plan*, that detail the scope and requirements of a plantation fire management plan.

4.2 Environmental Values in Plantations

Environmental values such as biodiversity, carbon sequestration, salinity control and water quality in plantations must be considered at all stages, from planning through to harvesting and re-establishment. Adverse impacts from plantations on environmental values, particularly water quality and river health, can be minimised by appropriate planning and management.

4.2.1 Water Quality, River Health and Soil Protection

Waterways include all permanent and temporary streams, pools, wetlands and drainage lines[3]. Well managed plantation establishment, tending, roading and harvesting operations near waterways may avoid unacceptable off-site impacts.

Operational Goals

Water quality and river health values are maintained or improved by protecting waterways from disturbance.

Soil erosion and water pollution are minimised by avoiding plantation operations in inappropriate areas or slopes and undertaking necessary preventive measures.

Mandatory Actions

Waterways

The entry of soil and other pollutants into waterways must be avoided as far as is practicable.

Storage, use and disposal of petroleum products and machinery servicing must not pollute the environment nor result in littering. Waste oil, all empty drums, discarded machinery parts and other waste must be removed from the forest and taken to an approved disposal facility. Toilet wastes must not be allowed to enter a waterway.

Plantation operations (including establishment, tending, roading, harvesting and re-establishment) must be planned and conducted in such a manner as to minimise mass movement or sedimentation of waterways.

Machinery activity within 20 metres of any waterway must be kept to the minimum necessary, to avoid soil disturbance.

Machinery activity must not occur within five metres of the saturated zone of a permanent or temporary stream (except for the minimum necessary to construct stream crossings), or wetland.

Crossing of waterways with ground-based machinery must be avoided, except when constructing or using a designated crossing. Where temporary crossings or log culverts are used, they must be removed immediately after harvesting or any subsequent replanting work for which they are required, using a technique that minimises soil disturbance.

Tree extraction must not cause disturbance to the bed or bank of permanent or temporary streams. Damage to associated riparian vegetation must be minimised.

Retained native vegetation along a waterway must be protected from damage caused by ground based plantation operations. Trees accidentally felled into retained vegetation or across a waterway may only be removed with minimal disturbance to vegetation or soil.

3 Note that artificial drainage lines (ditches) are not considered waterways for the purpose of this Code.

Additional measures to protect water quality and aquatic habitat, including increasing the zone of minimal machinery activity, must be adopted where there is a high local risk due to:

- the erodibility of soils;
- rainfall erosivity;
- steep slopes;
- particular riparian habitat values;
- the intensity and magnitude of the harvesting operation; or
- any particular requirements of a water supply off take point.

Steep Slopes

Plantation operations (including establishment, tending, roading, harvesting and re-establishment) must be planned and conducted in such a manner as to not compromise soil stability or lead to mass movement or sedimentation of waterways.

Operations must not occur on slopes where the operation cannot be conducted safely, or if it threatens the stability of the soil or has high potential for adverse off-site effects. The potential for mass soil movement must be assessed and necessary preventative actions applied.

Soil and water values must be protected by the limitation of site preparation and harvesting operations on steep slopes or on lesser slopes of unstable soil where erosion hazard is high.

On slopes greater than 30 degrees with low or medium soil erosion hazard, and slopes less than 30 degrees with a high or very high soil erosion hazard, additional measures must be taken to avoid movement of soil into streams, such as the adoption of cable harvesting or the provision of appropriate buffers and filter strips.

Legal Requirements

Any particular requirements to increase buffers due to the location of a water supply off-take point or any other relevant requirements set out in a Special Area Plan under the *Catchment and Land Protection Act 1994* must be observed.

Stream crossings must be designed to comply with the *Water Act 1989.* Works, including stream crossings, on designated waterways require a Works on Waterways permit from the relevant Catchment Management Authority.

Guidance

Water quality and river health may be protected by establishing or maintaining a zone of indigenous native vegetation along the riparian land. The retention of existing native vegetation and re-establishment of indigenous native vegetation along waterways is encouraged. The protection and restoration of the riparian zone is important to assist in the maintenance of healthy rivers and landscapes and the protection of social and cultural values.

Any unavoidable machinery activity near waterways should:

- be parallel to the waterway wherever practicable;
- done in such a way as to ensure water is not diverted from any waterways; and
- not take place when the soil is saturated.

Site preparation by non-mechanical means near waterways may minimise erosion and the risk of sedimentation to water quality.

Directing trees to fall away from a waterway will assist in minimising disturbance to the bed and banks of the waterway.

Harvest debris should generally be kept out of waterways but can remain within the buffer to protect soils. The removal of debris from a waterway may cause disturbance, and consideration should be given to the action that has the least impact on water quality.

Logging techniques specifically designed for steep slopes (such as cable logging) may assist in minimising soil movement.

The actual protection measures applied to protect waterways from disturbance will depend on the erodibility and permeability of soils, rainfall erosivity, topography, intensity and magnitude of harvesting operations.

There are appropriate Australian Standards for the storage and handling of fuels, such as AS1940, that should be considered to minimise the risk of pollutants entering waterways.

There may be other special requirements for water quality and soil protection set out in a regional River Health Strategy, or a Water Quality Plan prepared by the relevant Catchment Management Authority or Melbourne Water. These plans may provide guidance on appropriate additional protection measures.

4.2.2 Conservation of Biodiversity

Operational Goal

Planning and all operations in plantations address the conservation of biodiversity, including rainforest, in accordance with relevant laws.

Mandatory Actions

Retained native vegetation must be protected from damage caused by plantation operations.

Any burning operations undertaken must be planned and managed to minimise damage to retained native vegetation both within and outside the operational area.

Legal Requirements

Where prepared, Action Statements and/or Recovery Plans for species listed under the *Flora and Fauna Guarantee Act 1988* and the *Environment Protection and Biodiversity Conservation Act 1999* must be adhered to, to the extent that they apply to private land.

Any removal of native vegetation must comply with the native vegetation retention provisions (Clause 52.17) of the planning scheme, as applicable.

Under the *Catchment and Land Protection Act 1994*, all landholders have a responsibility to control pest animals and noxious weeds on their property.

The *Wildlife Act 1975* contains provisions to protect wildlife and includes requirements relating to control of wildlife species causing damage.

Guidance

Opportunities to improve the protection of threatened species or habitat values to achieve specific conservation objectives may include:

- application of protection measures specified in relevant *Flora and Fauna Guarantee Act* Action Statements, where they apply to private land;
- reserving strategic areas from harvesting; and
- modifying harvesting and silvicultural techniques.

Local government and the Department of Sustainability and Environment may provide guidance and further information to assist private land managers in protecting biodiversity during the preparation of Plantation Development Notices or Timber Harvesting Plans.

Selecting locally indigenous species for use in a plantation may assist in meeting regional conservation objectives.

4.3 Establishment and Management of Plantations

Establishment activities for plantation development include site preparation, chemical usage and processes for maintaining forest health.

4.3.1 Site Preparation

Site preparation activities should be appropriate for successful tree establishment and growth, whilst minimising potential adverse environmental impacts.

Operational Goal

Site preparation operations are appropriate to the characteristics of the particular site, and take into account the maintenance of soil and water values as well as site productivity.

Mandatory Actions

If waste timber and debris are to be burned, then burning must minimise damage to retained native vegetation within or outside the operational area.

Burning must not be conducted under powerlines except with approval from the power authority.

Where windrows or heaps are created, soil within them must be kept to a minimum.

Known Aboriginal cultural heritage places must be identified in the field and appropriately marked and buffered from disturbance, in accordance with any cultural heritage management plans (where prepared).

Legal Requirements

Any burning operations conducted as part of site preparation activities must comply with the *Country Fire Authority Act 1958* and any other relevant Acts, regulations and gazetted Codes of Practice, as required. Many Councils have Municipal Fire Plans that provide direction on safe conduct of burning operations.

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal cultural heritage management plan, undertaken in collaboration with Traditional Owners and any other relevant Aboriginal groups, may be required.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

Guidance

When a plantation is to be re-established on a harvested plantation site, harvesting debris should, where practicable, be retained as mulch rather than being burnt.

Site preparation techniques including ripping, ploughing and mounding could be used to promote successful tree establishment and growth, although such techniques must be planned and conducted in such a manner as to not compromise soil stability, or cause sedimentation of waterways or destruction of wetlands (as per Section 4.2).

Site preparation by non-mechanical means (eg. spot herbicide treatment) should be considered near waterways to protect soil values and be conducted in a way that minimises risks to water quality and river health. Where chemicals are used, refer to Section 4.3.2.

When creating windrows or heaps, soil movement can be minimised by using appropriate machinery such as bulldozers fitted with stick-rake blades or excavators fitted with grabs, and by using skilled operators.

4.3.2 Chemical Usage

Fertilisers may be applied at establishment and during the life of the plantation to stimulate growth and correct nutrient deficiencies. Chemicals may also be used to limit competition from grasses and weeds to maximise tree growth or to manage tree diseases or nutrient deficiencies affecting tree health.

Operational Goal

Fertiliser and chemicals are only used where appropriate to the site conditions and circumstances and with care for the maintenance and protection of water quality, biodiversity, soil values and neighbouring land uses.

Mandatory Actions

Where biosolids or other organic wastes or industrial by-product additives are used, they must be used in accordance with the law and conditions of any required approvals.

Chemical use must be appropriate to the circumstance and conducted with due consideration given to the maintenance of water quality, soil and biodiversity. Potential off-site, non-target impacts must be minimised.

When using herbicides or pesticides in declared Special Water Supply Catchment Areas, the relevant Water Authority must be notified prior to application.

Legal Requirements

The use of chemicals must be in accordance with relevant laws, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994* and the *Agricultural and Veterinary Chemical (Control of Use) Act 1992* and associated regulations.

Guidance

Application of bio-solids should be guided by the EPA publication 943 *Guidelines for Environmental Management: Bio-solids Land Application*.

The Australian Fertiliser Services Association has developed voluntary Codes of Practice for the responsible application of fertiliser to protect waterways and other values. These may assist in managing efficient and effective fertiliser use.

The fact sheet *Herbicides: guidelines for use in and around water,* prepared by the Cooperative Research Centre for Australian Weed Management, provides useful guidelines for the appropriate use of herbicides to control weeds near waterways.

Where chemicals are to be used, the preparation of a Chemical Application Plan, that specifies the target, the chemicals, target area application rates, methods and operational controls that will be adopted, may minimise unintended off-target and off-site impacts. It could also address the timing and a process for any notifications.

4.3.3 Plantation Health

Plantation health may be promoted through management practices such as thinning, salvage felling, weed, pest and disease control, to ensure the ongoing viability of the stand and avoid impacts on nearby landowners.

Operational Goal

Plantation health is monitored and maintained by employing appropriate preventative, protective and remedial measures.

Mandatory Actions

If the introduction of an exotic agent is suspected, Biosecurity Victoria must be informed.

Where there is a known risk of introducing pests and pathogens, the risk must be minimised through appropriate treatment of equipment when moving from known infected areas.

Trees in the vicinity of powerlines that are suffering from damage or disease must be removed where they are at risk of falling and making contact with powerlines.

Legal Requirements

Under the *Catchment and Land Protection Act 1994,* it is the responsibility of the land owner to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

Under the *Wildlife Act 1975*, browsing native animals that threaten regeneration may only be controlled under permits and in accordance with any associated conditions as issued by relevant authorities.

Guidance

The risks posed by pest plants and animals, and pathogens and other environmental stresses to plantation health should be assessed regularly and systematically so that problems are detected early and appropriate remedial strategies are implemented.

Various aspects of plantation health could be monitored and documented (aided by photographic records as appropriate) in assessments including crown and foliage condition, presence of damaging agents and description of damage levels.

Successful control or management of plantation health problems may require coordinated action involving adjacent landholders and other forest owners.

Nursery stock used for plantation establishment should be carefully screened or treated so as to avoid the accidental spread of weeds, pathogens or pests.

4.4 Plantation Roading

This section covers the planning, location, design, construction, maintenance and use of plantation roads, and stream crossings.

Operational Goal
The management of all roads that are part of plantation operations takes account of environmental and cultural values, the safety of road users and the intended use of the road.

4.4.1 Road Planning

Mandatory Actions
Road planning for new roads must:

- identify and record possible environmental risks and construction difficulties, so that adequate design standards can be used, and so that construction activities can be timed to minimise risks associated with wet weather;
- locate roads to minimise risks to environmental values, particularly soil, water quality and river health, during both construction and ongoing road use, while ensuring road user safety;
- locate roads so as to avoid and mitigate impacts on any known Aboriginal cultural heritage places; and
- minimise the number of stream crossings.

Legal Requirements
Road planning, including approval for stream and drainage line crossings, must comply with the *Catchment and Land Protection Act 1994*, the *Water Act 1989* and the planning scheme and any conditions of planning permits (refer Clause 52.18 of the planning scheme regarding repair of municipal roads).

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal cultural heritage management plan, undertaken in collaboration with Traditional Owners and any other relevant Aboriginal groups, may be required.

Threatened species may be protected under the *Environment Protection and Biodiversity Conservation Act 1999* or the subject of an Interim Conservation Order under the *Flora and Fauna Guarantee Act 1988*.

Guidance
Plans for permanent and temporary roads should be based on field inspection to ensure that all environmentally sensitive locations are identified and appropriate design and construction techniques adopted.

Matching the road route with the topography of the land will minimise earthworks and potential for adverse water quality impacts.

Undertaking necessary upgrades on stream crossings along the planned cartage routes within the plantation property boundary will assist in minimising water quality impacts due to increased traffic volumes.

Periodic reviews of roading networks will assist in ensuring the network is sufficient for intended uses, complies with relevant standards and to identify and treat any risks to environmental values.

When planning roading within a plantation, the provision of appropriate fire access routes should be considered.

Where there is potential Aboriginal cultural heritage present, the development of an Aboriginal cultural heritage management plan, in collaboration with Traditional Owners and any other relevant Aboriginal groups, will assist in identifying and mitigating any impacts on known cultural heritage values.

4.4.2 Road Design

Road design includes the consideration of traffic type and volume, surface materials, road shape as well as road infrastructure including culverts, drains, batters, bridges and fords.

Good road design is vital for maintaining water quality. It is important to control the speed (and hence erosivity) of water, and to provide the greatest possible infiltration to trap sediments before discharge into waterways.

Mandatory Actions

Plantation roads must be designed to a standard capable of carrying anticipated traffic with reasonable safety, and meeting Code requirements, particularly water quality.

Stream crossings must be designed according to the nature, size and period of flow (both pre and anticipated post harvest) and characteristics of the bed and banks of the stream.

Appropriate drainage must be provided. Spacing of drainage outlets along a road must take into account of the soil erodibility, the rainfall erosivity, and the proximity of the road to streams.

Energy dissipating structures or silt traps must be used where necessary to reduce water velocity and trap sediments.

Drainage onto exposed erodible soil or over fill slopes must be avoided where possible. Energy dissipating structures or silt traps must be used where required. Structures and earthworks required to avoid such discharges must be identified during planning and construction as required.

Stream crossings must be appropriately designed to minimise barriers to the passage of fish and other aquatic fauna.

Legal Requirements

Stream crossings must be designed to comply with the *Water Act 1989.* Works, including stream crossings, on designated waterways require a Works on Waterways permit from the relevant Catchment Management Authority or Water Authority.

Guidance

On steep slopes, engineering advice will assist in minimising risk of road failure.

Road design should seek to increase the frequency of road drainage in areas where the risk of soil entering waterways is high.

Important considerations in road design include the season of harvesting, volume and type of traffic, construction standards specified in the planning scheme (or a permit issued under the planning scheme), and the water quality values to be protected.

Drainage design should maximise the use of discharging water to vegetated areas. Sediment from operational roads is dominated by fine suspended material, therefore infiltration into soil is one of the most effective remedial strategies.

To avoid turbid water discharge into waterways, energy dissipating structures, silt traps or other protective measures may be placed to discharge into undisturbed vegetation. Placing adequate drainage structures approximately 20 metres from waterways will allow discharge onto undisturbed vegetation and maximise the flow distance between the drainage outlet and the waterway.

Additional drainage measures should be considered such as crowning or cross fall to ensure that water within 20 metres of a waterway discharges into undisturbed vegetation. Where this is not possible, drainage should not enter directly into a permanent or temporary stream without passing through an appropriate sediment control structure such as a sediment pond or silt trap.

Gravel surfacing with a low sediment generating potential applied to the road area on bridge approaches and on unsurfaced bridges or culverts will assist in reducing impacts on water quality. Where there are extended steep approaches to waterways, extending the length of gravel surfacing may be necessary.

Where possible, stream crossings should be adequately elevated and low approaches maintained such that water drains away from the crossing point and is discharged into vegetated areas rather than flowing directly down the crossing to the stream channel.

Roads may be designed and managed in accordance with:
- *Review of road classifications, geometric designs and maintenance standards for low volume roads* (Giummarra 2001);
- *Guidelines for assessment of applications for Permits and Licences for works on waterways* (Sinclair Knight Merz 2001);
- *Unsealed roads manual: Guidelines to good practice* (ARRB 2000); and
- *Fish Passage Requirements for Waterways Crossings* (NSW Fisheries 2004).

Bridges may be designed in accordance with AS5100 (2004) *Bridge Design.*

4.4.3 Road Construction

Mandatory Actions

Road construction must be conducted in a manner consistent with plans and designed to ensure the protection of water quality and river health, biodiversity conservation and Aboriginal cultural heritage values.

All fill disposal areas and embankments must be planned and designed to minimise soil erosion, mass soil movement, and potential water quality deterioration. When no longer required they must be stabilised.

Adequate temporary stabilisation must be employed to deal with site earthwork drainage and erosion control if road construction is halted or suspended for any reason.

Quarry materials must not be used if known to be infected with *Phytophthora cinnamomi.*

Construction operations must ensure that:
- disturbance to stream beds and banks is kept to a minimum;
- soil fill is not pushed into streams, nor placed into a position where there is a risk that it will erode into a stream; and
- cement, raw concrete, soil fill and other road making materials are not spilt into watercourses during any construction.

Legal Requirements

All quarries, gravel and borrow pits must be managed in accordance with the *Extractive Industries Development Act 1995*, the *Catchment and Land Protection Act 1994*, the planning scheme and any associated regulations.

Where discovered, Aboriginal cultural heritage must be identified in the field and appropriately marked and buffered from disturbance in accordance with any cultural heritage management plans prepared under the *Aboriginal Heritage Act 2006.*

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006.*

Guidance

Road construction should be conducted when rainfall and soil conditions minimise the risk of erosion and potential offsite impact on water quality.

Stabilisation can be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Additional information can be found in *Unsealed roads manual: Guidelines to good practice* (ARRB 2000).

Traffic management may be managed in accordance with AS 1742.3–2002 'Traffic control devices for works on roads' and the *Code of Practice for Worksite Safety – Traffic Management*.

4.4.4 Road Maintenance

Mandatory Actions

Roads used for timber cartage must be maintained to ensure protection of water quality and other environmental values. Road maintenance must be undertaken to minimise erosion and protect water quality.

Road drainage systems must be maintained to minimise erosion and the discharge of turbid water into streams.

Blading off of roads is only permitted where measures are in place to prevent potential adverse impacts on water quality.

Guidance

Roads that have grown over may be reopened for plantation management.

Legal Requirements

Under Clause 52.18 of the planning scheme, forest owners or managers are responsible for restoring any municipal roads used as a cartage route to the same condition they were in before the commencement of harvesting operations, to the extent of any damage caused as a result of the harvesting operations.

4.4.5 Suspension of Cartage

Mandatory Actions

Roads in plantations must be temporarily closed to heavy timber harvesting traffic when persistent wet weather or road stability compromise road drainage and water quality.

Roads in plantations must be temporarily closed to heavy timber harvesting traffic when persistent dry weather causes the surface materials to unravel to a degree that poses a threat to water quality, in the absence of suitable preventative or remedial actions to manage the risk to water quality.

Guidance

Central tyre inflation, road watering/rolling and other technology may provide suitable preventive or remedial actions to minimise the risks to water quality of persistent wet or dry weather.

Road surfacing, and upgrading of stream crossings to protect water quality can reduce risks to water quality due to road usage in sub-optimal periods.

4.4.6 Road Closures

Mandatory Actions

Roads must be closed (either temporarily or permanently) and effectively rehabilitated where they are no longer required or where their continued use will threaten environmental values.

Roads that are permanently closed must be adequately drained.

Guidance

Stabilisation of road surfaces can be achieved by measures such as, but not limited to, revegetation and use of erosion control materials.

4.5 Timber Harvesting

Timber harvesting is the felling of trees, and includes thinning of plantations. Mandatory Actions relevant to timber harvesting that are necessary for the protection of environmental values are described in Section 4.2.

Operational Goal

Timber harvesting is conducted in a manner appropriate to the site, to manage the impact on soil, water and other values, including biodiversity and cultural heritage.

Mandatory Action

All timber harvesting, including thinning operations, must be consistent with the Timber Harvesting Plan.

Legal Requirements

All timber harvesting must comply with the requirements of Clause 52.18 of the planning scheme and the conditions of any planning permit (where required as specified in the local planning scheme).

Tree clearing in the vicinity of powerlines is regulated by the *Electricity Safety (Network Assets) Regulations*. Non-authorised persons are prohibited from working on trees that may fall within up to six metres of network assets.

4.5.1 Timber Harvesting Plan

Operational Goal

A Timber Harvesting Plan is prepared in accordance with the requirements of this Code and submitted to the relevant local government prior to the commencement of harvesting operations.

Mandatory Action

A Timber Harvesting Plan must be submitted to local government not less than 28 days before the commencement of any harvesting operations.

The 28 day minimum lodgement time may be waived with the agreement of the local government.

When preparing a Timber Harvesting Plan the following issues must be addressed:

- protection of relevant environmental and cultural heritage values;
- methods to minimise impacts on water quality and river health from the operation and associated roads; and
- any necessary arrangements with the distribution authority for the electrical operational control of powerlines during harvesting.

The Timber Harvesting Plan must include:

- the months during which operations are to occur;
- estimated timber volumes to be harvested;
- proposed haulage routes;
- a map showing:
  - the plantation or coupe location;
  - significant features within the coupe boundary including waterways and any areas reserved or specifically managed for protection of biodiversity or aboriginal cultural heritage values;
  - the area(s) to be harvested;
  - new or upgraded roads;
  - powerlines;
  - plantation infrastructure

- conditions applying to the operation, including any permit conditions where required; and
- fire protection measures.

A copy of the Timber Harvesting Plan and any supporting prescriptions must be provided to the Harvesting Team Leader. The Plan's implementation, including specific prescriptions to be applied to the plantation, must be discussed with him/her. These documents must be available on site while operations are in progress. Amendments made to the Timber Harvesting Plan during the operation must be noted on the Plan and dated by the Harvesting Team Leader.

Boundaries must be identified in the field.

A Timber Harvesting Plan is current for 24 months following lodgement with the local government.

It applies to a single coupe, a number of coupes or to an entire plantation's harvesting operations.

Local government may accept the lodgement of a Timber Harvesting Plan for multiple locations and operations rather than individual Timber Harvesting Plans if it is satisfied that the composite Timber Harvesting Plan adequately covers the information required for all coupes included in the Plan.

For larger operations covering several coupes over a period of years, a Scheduling Plan may be prepared and submitted (with the agreement of local government), which identifies:
- coupe general locations;
- planned operational periods;
- cartage routes; and
- expected volumes.

This plan replaces the need to include this information on the Timber Harvesting Plan. Submitting a Scheduling Plan does not remove the requirement for the other information on a Timber Harvesting Plan to be prepared and submitted at the appropriate time.

A Scheduling Plan is current for up to five years following lodgement with local government, however any significant variations must be communicated to local government prior to their implementation.

Legal Requirements

The local government may place additional permit requirements on the Timber Harvesting Plan to meet local planning objectives.

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal cultural heritage management plan may be required, undertaken in collaboration with Traditional Owners and any other relevant Aboriginal groups.

Guidance

The Timber Harvesting Plan may also include information on:
- soil erosion hazard class (or classes) of the coupe area and associated operational restrictions (e.g. slope);
- type(s) of harvesting systems to be employed;
- areas within or adjacent to a coupe that are to be excluded from harvesting, or to which special prescriptions apply (eg. biodiversity protection or habitat enhancement, landscape protection, or protection of Aboriginal cultural heritage) and details of any special conditions or prescriptions appropriate to protecting those sites;
- methods to minimise the risk of impact with powerlines in the vicinity of the harvesting operations;

- measures to be employed to protect and rehabilitate soils and to ensure maintenance of water quality;
- location, design, construction, maintenance and closure of log extraction roads;
- location and methods of rehabilitation of log landings and dumps and, where necessary, siting and rehabilitation measures for major snig tracks;
- ways to minimise impacts on the visual landscape; and
- seasonal restrictions.

Where timber harvesting is to take place near residences, consideration should be given to the EPA publication *Guidelines for control of noise from industry in country Victoria* (or any subsequent document). Operating hours may be documented on the Timber Harvesting Plan.

For operations near powerlines, advice may be sought from the relevant distribution authority regarding necessary precautions considering the available clearances and terrain in the vicinity of the powerline.

The Timber Harvesting Plan may consider any objectives of regional River Health Strategies, Sustainable Water Strategies or any Water Quality Plans prepared by the Catchment Management Authority or Melbourne Water.

4.5.2 Plantation Infrastructure

The operation of a harvesting coupe generally requires the development and use of specific infrastructure, including log landings and dumps, and snigging and forwarding tracks. The planning and use of plantation infrastructure must be undertaken in a manner that minimises impacts on environmental values.

Mandatory Actions

Plantation infrastructure (including tracks) must be designed, located, constructed and maintained to minimise potential adverse impacts on soil and water quality, and Aboriginal cultural heritage values.

The placement of log landings and dumps must avoid areas that have been excluded from harvesting.

The area of log landings and log dumps must be minimised without compromising safety.

All infrastructure must be stabilised and rehabilitated to minimise erosion risk upon completion of operations, where not required for future operations. All tracks must be effectively rehabilitated to prevent soil erosion.

Extraction and forwarding tracks must be located to minimise potential adverse impact on soil and water quality and maintain effective drainage to prevent soil erosion. They should be placed at the greatest practicable distance from waterways, without compromising safety.

Cross-drains, where used, must be spaced and angled to prevent surface run-off and subsequent discharge into streams or drainage lines.

Guidance

Rehabilitation techniques could include draining the site, removing harvesting debris, ripping to reduce compaction and respreading topsoil. Existing topsoil may be stockpiled for use in rehabilitation of landings.

Tracks should be out-sloped, cross-drained or slash used to interrupt any flow of surface water down the track and disperse it onto undisturbed or uncompacted areas, avoiding off-site discharge into waterways.

Tracks should be designed with a view to minimising slope and cross-fall to assist drainage.

Rehabilitating tracks and other infrastructure at the earliest opportunity will minimise the risk of wet weather events creating unacceptable water quality outcomes.

4.5.3 Operational Restrictions

Mandatory Actions

Timber harvesting operations must be restricted or stopped where there is a risk to soil and water quality values during or following wet weather conditions.

Extraction, forwarding and cartage operations must be suspended when water begins to flow along tracks, except where appropriate preventive actions have been taken to address risks to off-site water quality.

Legal Requirements

Any known Aboriginal cultural heritage places must be identified in the field and appropriately marked and buffered from disturbance in accordance with any cultural heritage management plans (where prepared or relevant).

Other relevant operational restrictions might also be prescribed elsewhere. This may include, but not be limited to, conditions on a planning permit, and restrictions under the *Forests Act 1958* and *Country Fire Authority Act 1958*.

Guidance

A range of techniques to assist harvesting such as flotation tyres and the use of harvesting slash on extraction tracks can be used to extend the operational window for compliance with the Code, while minimising the impact of the operation on environmental values.

When significant compaction, rutting or soil mixing is likely to occur, on landings or tracks, the suspension of extraction, forwarding and carting operations will protect on-site soil and water quality.

4.5.4 Safety

Operational Goal

All operations are conducted in a manner that meets all safety and duty of care requirements.

Legal Requirements

All operations must comply with the requirements of the *Occupational Health and Safety Act 2004*, regulations made under that Act and any relevant Compliance Codes.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant Regulations and Codes of Practice prepared under that Act.

Glossary

The following definitions apply to the interpretation of terms used in this Code:

Aboriginal Culture – Indigenous culture is a living entity and includes stories, cultural practices and ongoing use of natural resources like bark, timber, native plants, animals and minerals for cultural purposes. Aboriginal people continue to have strong ongoing associations with the land, including forests and their involvement in the management of forests and its' associated resources is vital to their community's identity and wellbeing.

Aboriginal Cultural Heritage Places – are places of Aboriginal cultural significance and can include spiritual and ceremonial places, travel paths, as well as Aboriginal archaeological sites (such as stone artefact scatters, scarred trees, shell middens, rock art, quarries and earthen mounds) and historic (post-European contact) places.

Agroforestry – as defined in the Victoria Planning Provisions – 'the simultaneous and substantial production of forest and other agricultural products from the same land unit'.

Authorised officer – a person appointed as an Authorised officer under the *Conservation Forests and Lands Act 1987* and other relevant Acts (*Forests Act 1958*).

Biodiversity – the natural diversity of all life: the sum of all our native species of flora and fauna, the genetic variation within them, their habitats, and the ecosystems of which they are an integral part.

Blading-off – the use of a machine to sweep drifts of loose mud, slush, vegetation or soil from the surface of a road or coupe infrastructure (landings etc).

Borrow pit – an excavation sometimes made alongside a road in order to obtain gravel or other material for use in road construction or surfacing.

Buffer (strip) – a protective margin of vegetation excluded from any harvesting activity abutting a waterway or an area of rainforest or other special area, which protects it from potentially detrimental disturbances in the surrounding forest. Buffer width is defined as horizontal distance from which various operations are excluded.

Burn Plan – a plan for public land which, in the required DSE format, is approved for the conduct of prescribed burning and contains a map identifying the area to be burned and incorporates the specifications and conditions under which the operation is to be conducted. Refer to the *Code of Practice for Fire Management on Public Land (2006).*

Burra Charter – a set of guidelines developed by Australia ICOMOS (International Council on Monuments and Sites), to provide guidance for the conservation and management of places of cultural significance.

Cable harvesting – a hauling system using towers, winches, blocks and cables to extract harvested timber.

Chemical control agent – refer to Pesticide.

Clear-felling – silvicultural method of harvesting a coupe whereby all merchantable trees, apart from those to be retained for wildlife habitat, are removed.

Cording and matting – a technique to reduce soil disturbance by placing woody debris over machinery work areas, that is removed following operations.

Coupe – a single area of native forest or plantation of variable size, shape and orientation from which timber is harvested in one operation.

Cross draining (of roads) – placing of interception drains provided across the longitudinal direction of the road to divert water from the road surface.

Crowned (in relation to roads) – the formation of a road surface by a grader or dozer to a convex-shape from which water will freely drain to both sides away from the middle.

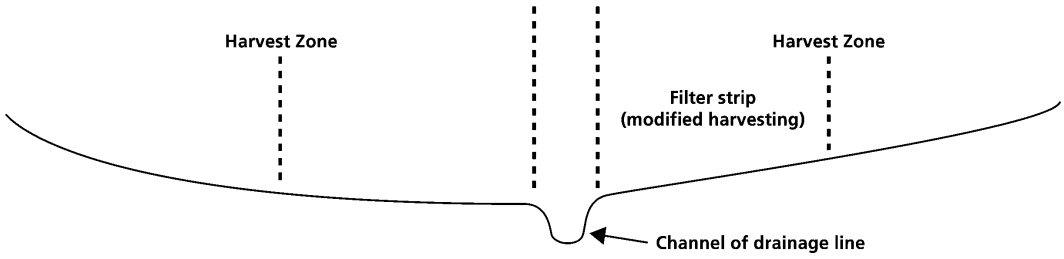
Cultural Heritage Management Plan – is a written report, prepared under Part 4 of the *Aboriginal Heritage Act 2006*, that assesses an area to determine the nature of any Aboriginal cultural heritage present in the area; and makes recommendations for measures to be taken before, during and after an activity to manage and protect the Aboriginal cultural heritage identified in the assessment.

Drainage lines – are depressions that have visible evidence of periodically flowing water (including obvious sedimentation or other clear evidence of overland flow) that feed into temporary or permanent streams. A defined channel may or may not be present. Visible water flow would be expected after storm events or briefly in the wettest times of the year. Distinctive riparian vegetation is not likely to be present.

Artificial drainage lines that do not discharge directly into waterways are not considered within the above definition.

In native forests, drainage lines will generally be protected from harvesting by a filter strip (Figure 3). Refer to Tables 2 and 3.

Figure 3 – Drainage Line[4]



Erosion risk – the likelihood of erosion occurring due to soil erodibility, rainfall erosivity, slope and soil disturbance.

Exotic – introduced to Australia, not native.

Extraction – removing produce from stump to log landing or storage area.

Extraction track – the track along which logs are extracted from the forest to the roadside or a landing. Also called a forwarding track or a snig track.

Fill disposal area – site where surplus soil and rock material produced as a by-product of road construction operations may be stockpiled or disposed of.

Filter strip – a strip of vegetated ground adjacent to a waterway (with merchantable overstorey removed) retained to minimise soil compaction and erosion. Trees may be felled from within a filter strip subject to certain conditions, however machinery entry is generally not permitted.

4 diagrams not to scale: zone widths vary according to circumstance.

Forest Coupe Plan – a plan that must be prepared for each harvesting operation in public native forest, containing 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 Plan – a plan for public land applying to one or several Forest Management Areas, that is approved by the Secretary of the Department of Sustainability and Environment, which addresses the full range of values and uses in the Area.

Forwarding track – an extraction track along which logs are carried in a forwarder.

Habitat Tree – a tree identified and protected from harvesting to provide habitat or future habitat for wildlife. A habitat tree may be living or dead, and often contains hollows that are suitable shelter and/or nesting sites for animals such as possums and parrots.

Harvesting Team Leader – the principal licensee or harvesting contractor, or a person appointed by the principal licensee or harvesting contractor, responsible for supervising and controlling a timber harvesting operation in the forest.

Landing – a place where trees or parts of trees are sorted, processed and/or loaded for transport from the forest. Areas where there has been no significant soil disturbance associated with landing establishment, and where no further processing takes place, are not regarded as landings. Conversion sites that do not involve earthworks or clearing, or where there has been no significant soil disturbance, are also not regarded as landings.

Landscape sensitivity (high) – areas identified as having a high scenic quality and visual sensitivity. They are usually areas that are readily visible from high-usage recreational facilities such as look-outs, walking tracks, tourist roads, or campsites.

Local government – see **Responsible Authority**. Note that the term local government has been used throughout this Code for ease of reader use, however it is the Responsible Authority (which is usually the local government) that administers the operation of the Code on private land and for plantations.

Microclimate – climate of a small, localised part of a forest. Vegetation, soil conditions and local topography may create pronounced microclimatic differences.

Mixed Forest – an intermediate community between rainforest and surrounding vegetation. Comprises a closed (70 per cent projected foliage cover) stratum of mainly rainforest canopy species beneath a eucalypt canopy which exceeds 10 per cent crown cover. The eucalypt canopy can be any age.

Native Forest – an area originally naturally occurring, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding two metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20 per cent. This definition includes areas of trees that are sometimes described as woodlands, but does not include plantations (which may exhibit the characteristics of a native forest but are established for commercial purposes).

Native vegetation – plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses.

New plantation – a plantation development where the previous landuse was not plantation.

Outsloping (of roads or tracks) – the formation of a road or track surface to provide slope or camber so that water will drain from it on the outside of the road/track. Sometimes called 'cross-sloping'.

Permanent Road – a generally high standard road permanently required for the continuing management of the forest including timber harvesting.

Permeability (high) – soils with high permeability and low potential for overland flow are soils which are able to directly absorb large quantities of water without producing any significant run-off. The soils will be generally well structured with a friable surface and a high organic matter content.

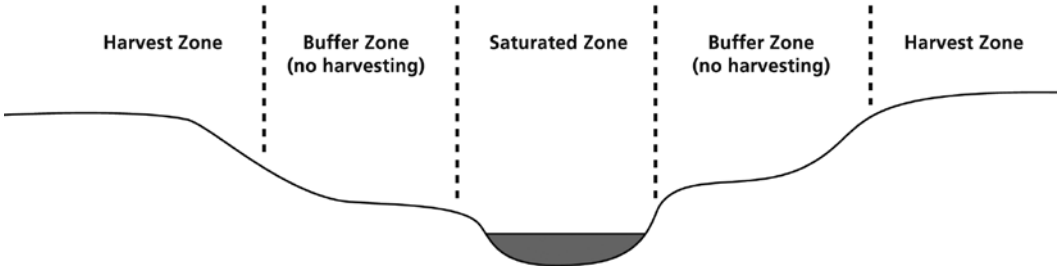
Permeability (low) – soils with low permeability and high potential for overland flow are soils which will not readily absorb heavy falls of rain nor small surface flows of water. The soils will be generally poorly structured with poorly defined aggregation.

Permanent streams – rivers and streams that flow throughout the year. Permanent streams may stop flowing or dry out in extremely dry years. Permanent streams will support distinctive riparian vegetation (except where previously removed by human activity, and not including *E camaldulensis*), indicative of extended periods of saturation and distinguishable from vegetation communities in surrounding areas. Streams have a well-defined incised permanent channel.

See also **Pools** and **Wetlands**.

In native forests, permanent streams, pools and wetlands are buffered from harvesting (Figure 4). Refer to Tables 2 and 3.

Figure 4 – Permanent stream, pool or wetland[5]



Pesticide (and/or Chemical control agent) – a chemical product that is used to control pest plants or animals. Includes herbicides, insecticides, fungicides, rodenticides and other similar products. Their registration for sale and use is controlled by State and Commonwealth legislation.

Plantation – managed stands of trees of either native or exotic species, planted or sown primarily for timber production purposes.

Plantation Development Notice – a notice that must be prepared and lodged with local government before a plantation is established for the first time. The notice must contain the information set out in Section 4.1 of this Code.

Pool – an area of still water of at least 4 metres in diameter within or adjacent to the main channel of a permanent or temporary stream. A pool may dry out in extremely dry years. In native forests, pools are buffered from harvesting (refer to Tables 2 and 3).

5 Diagrams not to scale: zone widths vary according to circumstance.

Precautionary principle – when contemplating decisions that will affect the environment, the precautionary principle requires careful evaluation of management options to wherever practical avoid serious or irreversible damage to the environment; and to properly assess the risk-weighted consequences of various options. When dealing with threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Private land – for the purposes of this Code, private land comprises:
i) land alienated from the Crown;
ii) unalienated land of the Crown managed and controlled by other than the Minister for Water, Environment amd Climate Change, the Minister for Agriculture, or the Secretary of the Department of Sustainability and Environment;
iii) unalienated land of the Crown occupied under a lease from the Crown; or
iv) land licensed under the *Victorian Plantations Corporation Act 1993*.

Provenance (of seed) – the original geographic source or place from which that seed was obtained.

Public land – unalienated land of the Crown managed and controlled by the Minister for Water, Environment and Climate Change, the Minister for Agriculture, or the Secretary of the Department of Sustainability and Environment, whether or not occupied under a licence or other right (but not including land occupied under a licence under the *Victorian Plantations Corporation Act 1993*).

Rainfall erosivity – is the potential of rainfall to cause soil erosion and is directly related to rainfall amount and rainfall intensity.

Rainforest community – closed (>70 per cent projected foliage cover) broadleaved forest vegetation with a more or less continuous rainforest tree canopy of variable height, and with a characteristic composition of species and life forms, of at least 1000 square metres in area. Refer to the *Rainforest and Cool Temperate Mixed Forests Action Statement* for a full definition including field identification.

Rainforest tree canopy species – characteristic shade tolerant tree species that are able to regenerate below an undisturbed canopy, or in small canopy gaps resulting from locally recurring minor disturbances, such as isolated windthrow or lightning strike, which are part of the rainforest ecosystem. Such species are not dependent on fire for their regeneration.

Regeneration – the renewal or re-establishment of native forest flora by natural or artificial means following disturbance such as timber harvesting or fire.

Rehabilitation – the restoration and revegetation of a site of disturbance usually associated with landings and other within-coupe infrastructure.

Responsible Authority – as defined in S.13 of the *Planning and Environment Act 1987*. Generally the local government authority responsible for administering the local planning scheme.

Retained trees – trees retained on a coupe during a harvesting operation because they are unmerchantable, are to serve as seed trees or wildlife habitat trees, or have been selected to grow on after thinning.

Riparian vegetation – vegetation that requires free or unbound water, or conditions that are noticeably moist along the margins of streams, drainage lines, and lakes.

River health – an ecologically healthy river is one where the major natural features, biodiversity and/or functions of the river are still present and will continue into the future. Some change from the natural state may have occurred to provide for human use.

Rotation – the planned number of years between the regeneration of a forest stand and its final harvesting, taking into account the full range of values and uses the owner wishes to derive from the forest.

Run-off (with regard to road construction) – a short graded channel angled away from road edges to divert road drainage water off the road into undisturbed vegetation. Sometimes called a mitre drain.

Saturation zone – associated with waterways, the area where the soil is muddy or permeated with water attributable to the water body. The zone ends where moisture is no longer visibly present in the soil. This zone is often delineated by riparian vegetation.

Seed tree system – a silvicultural system used for harvesting and regeneration. All merchantable trees are harvested apart from those specifically retained for regenerating the coupe by natural or induced seedfall and for habitat purposes.

Seed trees – trees retained on harvested coupes to provide seed for natural regeneration of that coupe. May also be a **Habitat Tree**.

Selection systems – silvicultural systems used for harvesting and regeneration. Trees are harvested either singly or in small groups at relatively short intervals (usually 10–20 years) over the rotation. Regeneration is established in the gaps produced and an uneven-aged stand is maintained.

Shelterwood system – a silvicultural system used for harvesting and regeneration. The original stand is removed in two fellings. Firstly a proportion of the mature trees are cut to allow the establishment of essentially even-aged regeneration under sheltered conditions, followed by a second felling (usually about 10 years later) of the remainder of the mature (seed) trees.

Silviculture – the science and practice of managing harvesting, forest establishment, composition, and growth, to achieve specified objectives.

Site preparation – the preparation of the ground to provide conditions suitable for seedling establishment by either seed or planted seedlings.

Snigging – the towing or winching of a log from the stump to the landing site, usually along a snig track.

Snig track – the track along which a log is snigged.

Soil erodibility – the susceptibility of a soil to erosion when exposed and/or disturbed. Classified into low, medium or high according to prescribed techniques.

Special Water Supply Catchment – a catchment that has been officially declared under Schedule 5 of the *Catchment and Land Protection Act 1994*. More information available at www.dpi.vic.gov.au/vro/

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 forest comprises publicly owned land which is managed for the conservation of flora and fauna; for the protection of water catchments and water quality; for the provision of timber and other forest products on a sustainable basis; for the protection of landscape, archaeological, historical and other cultural values; and to provide recreational and educational opportunities.

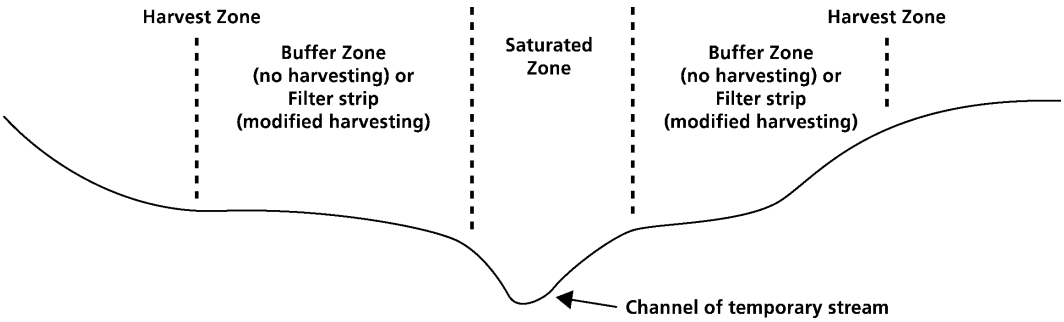
Stocking – a measure of density of any given forest stand, which can be expressed in a variety of terms, such as the number of trees per hectare, the basal area per hectare, and the percentage of stocked plots.

Temporary road – a timber-extraction road constructed specifically for use during the harvesting operation and closed at the completion of operations. It is generally a short length of road leading from a permanent timber extraction road to a landing or series of landings in one or more harvesting coupes.

Temporary streams – streams that have a clearly defined continuous channel or streambed and flow during certain seasonal periods of the year, such as following snowmelt, but not throughout the year. Temporary streams contain distinctive riparian vegetation (except where previously removed by human activity, and not including *E camaldulensis*), indicative of periods of saturation and distinguishable from vegetation communities in surrounding areas.

In native forests, temporary streams may be protected from harvesting by buffers or filter strips (Figure 5). Refer to Tables 2 and 3.

Figure 5: Temporary Stream[5]



Tending – the treating of a forest stand to protect, maintain, or improve its stand health and/or timber production potential.

Thinning – the removal of part of a forest stand or crop, with the aims of increasing the growth rate and/or health of retained trees and, in commercial thinning, obtaining timber from trees that would otherwise eventually die before final harvest.

Timber – a general term used to describe standing trees or felled logs before their processing into wood products. This includes timber from trees or parts of trees which are specified as available for timber harvesting, but does not include firewood collected for domestic use.

Timber extraction roading – the road network in areas of forest for the primary purpose of extracting or carting timber from the forest.

Timber growing – an activity that includes regeneration, planting and tending of trees and tree crops for wood production.

Timber harvesting – includes tree felling, log snigging and forwarding, and the sorting, loading and carting of timber.

Timber Harvesting Plan – a plan prepared under this Code of Practice for private native forests (Section 3.1) and plantations (Section 4.5), usually consisting of a map identifying the area(s) to be harvested and a statement of conditions applying to the operation, and lodged with the Responsible Authority. The plan may apply to a single coupe or to an area in which a number of coupes are to be harvested.

5 Diagrams not to scale: zone widths vary according to circumstance.

Timber production – the growing and harvesting of timber from native forests and plantations.

Timber Release Plan – a plan prepared by VicForests in accordance with the Part 5 of the *Sustainable Forests (Timber) Act 2004*. Plans are required in respect of an area to which an allocation order applies for the purposes of harvesting timber resources and undertaking associated management activities in relation to those timber resources. The Timber Release Plan must be consistent with this Code of Practice and made publicly available.

Water supply catchment – a catchment from which water is used for domestic water supply purposes.

Waterway – a permanent stream, temporary stream, drainage line, pool or wetland as defined in this Code.

Wetland – a permanent spring, swampy ground, wetland or other body of standing water. A wetland may dry out seasonally. A wetland will support distinctive riparian vegetation (not including *E camaldulensis*), indicative of extended periods of saturation and distinguishable from vegetation communities in surrounding areas.

Wildlife – an animal as defined under the *Wildlife Act 1975.*

Wildlife corridor – a strip of forest of varying width reserved from harvesting, to facilitate fauna movement including gene movement between patches of forest of varying ages and stages of development.

Wood Utilisation Plan – a plan prepared by DSE, detailing the location, nature and approximate timing of timber harvesting including the location of associated access roads and a plan for the allocation of wood to processors. The Plan is generally produced to cover a three-year period, with detailed specifications for the first year and indicative specifications for the following two years, and updated annually. The Plan must be consistent with this Code of Practice and made publicly available.

Legislation, Regulations and Policies applying to forest management for timber production on public and private land

Commonwealth Legislation	Public Land	Private Land
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	✓	✓
Australian Heritage Commission Act 1975	✓	✓
Environment Protection and Biodiversity Conservation Act 1999	✓	✓
Export Control Act 1982		✓
National Environment Protection Measures (Implementation) Act 1998	✓	✓
Native Title Act 1993	✓	✓
Quarantine Act 1908	✓	✓
Regional Forests Agreement Act 2002	✓	✓

State legislation	Public Land	Private Land
Aboriginal Heritage Act 2006	✓	✓
Accident Compensation Act 1985	✓	✓
Agricultural and Veterinary Chemicals (Control of Use) Act 1992	✓	✓
Agricultural and Veterinary Chemicals Act 1994	✓	✓
Building Act 1993	✓	✓
Catchment and Land Protection Act 1994	✓	✓
Conservation, Forests and Lands Act 1987	✓	✓
Country Fire Authority Act 1958	✓	✓
Crown Land (Reserves) Act 1978	✓	
Dangerous Goods Act 1958	✓	✓
Electricity Safety Act 1998	✓	✓
Emergency Management Act 1986	✓	✓
Environment Protection Act 1970	✓	✓
Extractive Industries Development Act 1995	✓	✓
Fences Act 1968		✓
Firearms Act 1996	✓	✓
Fisheries Act 1995	✓	✓
Flora and Fauna Guarantee Act 1988	✓	✓
Forests Act 1958	✓	✓
Forest Rights Act 1996		✓
Heritage Act 1995	✓	✓
Heritage Rivers Act 1992	✓	✓
Land Act 1958	✓	✓
Land Conservation (Vehicle Control) Act 1972	✓	
Local Government Act 1989		✓
Occupational Health and Safety Act 2004	✓	✓
Planning and Environment Act 1987	✓	✓
Planning and Environment (Planning Schemes) Act 1996		✓

State legislation	Public Land	Private Land
Plant Health and Plant Products Act 1995	✓	✓
Prevention of Cruelty to Animals Act 1986	✓	✓
Reference Areas Act 1978	✓	
Road Management Act 2004	✓	✓
Safety on Public Lands Act 2004	✓	
Summary Offences Act 1966	✓	
Sustainable Forests (Timber) Act 2004	✓	
Water Act 1989	✓	✓
Wildlife Act 1975	✓	✓

Regulations	Public Land	Private Land
Agricultural and Veterinary Chemicals (Control of Use) Regulations 1996	✓	✓
Country Fire Authority Regulations 2004		✓
Dangerous Goods (Explosives) Regulations 2000	✓	✓
Dangerous Goods (HCGD) Regulations 2005	✓	✓
Dangerous Goods (Storage and Handling) Regulations 2000	✓	✓
Electricity Safety (Line Clearance) Regulations 2005	✓	✓
Electricity Safety (Network Assets) Regulations 1999	✓	✓
Extractive Industries Development Regulations 1996	✓	✓
Flora and Fauna Guarantee Regulations 2001	✓	
Forests (Fire Protection) Regulations 2004	✓	
Forests (Miscellaneous) Regulations 2000	✓	
Land Act Regulations 1996	✓	✓
Land Conservation (Vehicle Control) Regulations 2003	✓	
Road Management (General) Regulations 2005	✓	
Sustainable Forests (Timber Harvesting) Regulations 2006	✓	

Policy	Public Land	Private Land
Code of Practice for Fire Management On Public Land (2006)	✓	
Code of Practice for Safety in Forest Operations (1990)	✓	✓
National Forest Policy Statement (1992)	✓	✓
Victoria's Native Vegetation Management – A Framework for Action (2002)	✓	✓
Our Forests, Our Future (2002)	✓	
State Environment Protection Policy (Air Quality Management)	✓	✓
State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade)	✓	✓
State Environment Protection Policy (Groundwaters of Victoria)	✓	✓
State Environment Protection Policy (Waters of Victoria)	✓	✓
Victorian Pest Management Framework (2002)		
Victorian River Health Strategy (2002)	✓	✓
Victorian Biodiversity Strategy (1997)	✓	✓

Guidance Documents

The following documents may assist forest managers to achieve the operational goals and mandatory actions set out in the Code.

- Australian Heritage Commission (2002) *Ask First: A guide to respecting Indigenous heritage places and values*
- Australian Standard 5100–2004 *Bridge Design*
- Australian Standard 1742 *Manual of uniform traffic control devices*
- Australian Standard 1940–2004 *The storage and handling of flammable and combustible liquids*
- Department of Sustainability and Environment (2005) *Management Procedures for Timber Harvesting Operations and Associated Activities in State Forests in Victoria*, October 2005. Available at www.dse.vic.gov.au
- EPA publication number 275 *'Construction techniques for sediment pollution control'*
- EPA publication number 464.2 *'Use of reclaimed water'*
- EPA publication number N3–89 'Interim guidelines for control of noise from industry in country Victoria'
- EPA publication number 943 *'Guidelines for Environmental Management: Biosolids Land Application'*
- Gippsland Private Forestry Inc (2004) *Model template for a Timber Harvesting Plan (THP) for private land in Victoria*. Prepared for Timber Towns Victoria (a Local Government Association). Available from http://www.gpf.com.au/
- Giummarra, G. (ed) (2000) *Unsealed roads manual: Guidelines to good practice.* Revised Ed. Australian Roads Research Board Transport Research Ltd.
- Giummarra, G. (2001) *Review of road classifications, geometric designs and maintenance standards for low volume roads. Research report* ARR 354. ARRB Transport Research Ltd. p47.
- Greening Australia (2002) *A Landowners Guide to Managing Private Native Forests in Gippsland*
- *Herbicides: guidelines for use in and around water*, factsheet prepared by Cooperative Research Centre for Weeds management, available from www.weeds.crc.org.au
- NSW Fisheries (2004) *Fish Passage Requirements for Waterways Crossings.*

- Native Forest Silviculture Guideline series Nos 1–14, prepared by Department of Sustainability and Environment (and predecessors), available at www.dse.vic.gov.au
  No 1. Seed crop monitoring and assessment (1993)
  No 2. Seed collection (1994)
  No 3. Seed extraction, cleaning and storage (1994)
  No 4. Eucalypt seed sampling and testing (1995)
  No 5. Eucalypt seed coating (2001)
  No 6. Site preparation (1998)
  No 7. Browsing management (2005)
  No 8. Eucalypt sowing and seedfall (2001)
  No 9. Eucalypt planting (1993)
  No 10. Eucalypt stocking surveys (1997)
  No 11. Management of landings, bark and extraction tracks (2004)
  No 12. Treatment of non-merchantable trees (1999)
  No 13. Thinning of Ash regrowth (2006)
  No 14. Thinning of mixed-species regrowth (1997)
- Sinclair Knight Merz (2001) *Guidelines for assessment of applications for Permits and Licences for works on waterways.*
- *The Farmer's Log: Australian Master Treegrowers Manual* (1999)
- VicRoads (2004) *Code of Practice for Worksite Safety – Traffic Management*, available from www.vicroads.vic.gov.au/
- VicRoads Road and Bridge Design Manuals
- VicRoads Worksite Traffic Management (Roadworks Signing Code of Practice)
- VPP Practice Note – *Timber Production in the Rural Zone* (02/99), available at www.dse.vic.gov.au/