

CODE OF PRACTICE FOR TIMBER PLANTATIONS IN WESTERN AUSTRALIA



First published August 2006
Second Edition 2014

ISBN: 0-9775894-0-4

© 2014 Forest Industries Federation (WA) Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means — electronic, mechanical, photocopying, recording or otherwise — without prior written permission of the Forest Industries Federation (WA) Inc. Enquiries should be made to:

The Executive Director,
Forest Industries Federation (WA) Inc.
Unit 1, 5 Turner Ave
BENTLEY WA 6102
Phone: (08) 9472 3055
Fax: (08) 9472 3155

Whilst every effort has been made to ensure the accuracy of the information contained in this publication, no guarantee can be given that all errors and omissions have been excluded. Forest Industries Federation (WA) Inc. can accept no responsibility for loss occasioned to any person acting or refraining from action as a result of the material in this publication.

Table of Contents

Acknowledgments	v
Glossary of Terms	vii
Acronyms	xiii
Section 1: Scope of the Code of Practice.....	1
1.1 Introduction	1
1.2 Land Ownership and Management Arrangements.....	2
1.3 The Need for a Code of Practice.....	2
1.4 Changes to the Code	3
1.5 Breaches of the Code	4
1.6 Documentation of Operational Procedures	4
Section 2: Plantation Management Principles.....	5
2.1 National Principles	5
2.1.1 Principles of Environmental Care.....	6
2.1.2 Safety	6
2.1.3 Planning	7
2.1.4 Access	7
2.1.5 Establishment and Maintenance	7
2.1.6 Timber Harvesting	7
2.1.7 Forest Protection.....	8
2.1.8 Monitoring and Review	8
2.2 General Principles	8
2.2.1 Economic Benefits of Plantations.....	8
2.2.2 Social Benefits of Plantations.....	9
2.2.3 Environmental Benefits of Plantations	9
2.3 Water Resources and Salinity	9
2.4 Certification.....	9
2.4.1 FSC® Certification.....	10
2.4.2 AFS Certification.....	10
2.4.3 Product Labelling.....	11
2.5 Significant Values	11
Section 3: Acts, Regulations and Key Reference Documents Relevant to Plantation Management	12
Section 4: Goals and Guidelines for Plantation Management.....	24
4.1 Explanation.....	24
4.2 Management Plans	24
4.3 Plantation Location, Planning and Design	25
4.4 Plantations within Public-drinking-water Source Areas	26
4.5 Roads	28
4.5.1 Plantation Roads	28

4.5.2	Public Roads	33
4.6	Silviculture of Plantations.....	34
4.6.1	Site Assessment	34
4.6.2	Species Selection	35
4.6.3	Site Preparation.....	35
4.6.4	Fertilising.....	36
4.6.5	Weed Control.....	37
4.6.6	Control of Insects.....	38
4.6.7	Control of Vertebrate Pests.....	39
4.6.8	Disease Control and General Plantation Health	40
4.6.9	Thinning and Pruning	40
4.6.10	Coppice Management	41
4.7	Timber Harvesting	41
4.7.1	Planning	41
4.7.2	Felling Operations	42
4.7.3	Processing and Extraction.....	42
4.7.4	Log Landings and Processing Sites	43
4.7.5	Haulage	43
4.8	Reversion.....	44
4.9	Storage and Handling of Chemicals, Fuels and Oils.....	44
4.10	Incident Management.....	45
4.11	Agriculture Protection and Neighbour Relations	46
4.12	Research and Development	47
4.13	Safety	47
4.14	Competency and Training.....	47
	Section 5: Fire Prevention and Suppression.....	49
5.1	Fire Prevention	49
5.2	Bushfire Suppression	50
	Appendix 1: Protocols for Management Plans.....	51
	Appendix 2: Plantation Timber Haulage Notification to Local Governments and Other Road Managers	55
	Appendix 3: Aerial Spray Application Management Plan	63

Note: All words in this Code that are shown in **bold** are defined in the glossary (p. vii).

Acknowledgments

The Forest Industries Federation (WA) Inc. (FIFWA) acknowledges the assistance of many government and non-government organisations in the production and revision of this Code - particularly Australian Forest Growers (AFG), the Forest Products Commission (FPC), and Commercial Plantations Western Australia (CPWA) - for their time and effort in developing this Code.

Denis Sawers	Albany Plantation Export Company (APEC)
Geoff Rolland	Albany Plantation Forest Company of Australia Pty Ltd (APFL)
Geoff McArthur	Australian Forest Growers (AFG)
Melissa Loud	Forest Industries Federation of WA Inc (FIFWA)
Bob Pearce	Forest Industries Federation of WA Inc (FIFWA)
Ray Fremlin	Forest Products Commission (FPC)
Carol Dymond	Forest Products Commission (FPC)
Alan Hordacre	Great Southern Plantations (GSP)
Gavin Ellis	Great Southern Plantations (GSP)
Mark Giblett	Great Southern Plantations (GSP)
Brett Humble	Hansol PI Pty Ltd
Gary Inions	Hansol PI Pty Ltd
Carl Richardson	Integrated Tree Cropping (ITC)
Julia Levinson	Timber 2020
George Bray	Timbercorp
Tim Browning	Timbercorp
Rick Mitchell	Timbercorp
Leonie Offer	Trees Southwest
Murray Bowles	WA Plantation Resources (WAPRES)
Richard Breidahl	WA Plantation Resources (WAPRES)
Stephen Martyn	WA Plantation Resources (WAPRES)
Geoff Bertolini	Whittakers Timber Products

Specific thanks are extended to the following persons on the Code Review Committee 2013/2014.

Geoff Rolland	Albany Plantation Forest Company of Australia Pty Ltd (APFL)
Carl Richardson	Australian Bluegum Plantations Pty Ltd (ABP)
Charlie Saykao	Australian Bluegum Plantations Pty Ltd (ABP)
Murray Anning	Australian Bluegum Plantations Pty Ltd (ABP)
Leanne Tomlinson	Australian Bluegum Plantations Pty Ltd (ABP)
Steve Pickering	Bunbury Fibre Plantations Pty Ltd
Melissa Haslam	Forest Industries Federation of WA Inc (FIFWA)
Rav Mukushi	Forest Industries Federation of WA Inc (FIFWA)
David Guille	Forest Products Commission (FPC)
Andrew Mill	Forest Products Commission (FPC)
Dale Cameron	PF Olsen (Aus) Pty Ltd
David Bennet	PF Olsen (Aus) Pty Ltd
Davin Gibellini	WA Plantation Resources (WAPRES)
Mark Lush	WA Plantation Resources (WAPRES)

The Code Review Committee as listed above would like to acknowledge the involvement of a wider group of stakeholders including:

Australian Forest Growers	Australian Forest Services	CSIRO
Department of Agriculture and Food	Department of Fire and Emergency Services	Department of Parks and Wildlife
Department of Planning and Infrastructure	Department of Water	Worksafe

and Shires in the South-West and Great Southern regions.

Glossary of Terms

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

Aerial spraying contractor: the aerial spraying contractor engaged by the target **plantation manager** to apply **pesticides** or fertilisers to the target **plantation area** by means of aircraft.

Batter: the inclination or shapes, of a roadside cutting or soil fill, beside a road.

Borrow pit: an excavation, usually close to a road, that is used to provide material to construct a road or approaches to a bridge.

Buffer: a strip of land abutting a feature including (1) the **riparian zone** of a **watercourse**; (2) an area of environmental significance that provides a **buffer zone** between the **plantation** and the feature; or (3) a dwelling, urban or special rural area.

Catchment: a discrete area of land that drains water into a **watercourse** or water body. A water catchment may be a series of sub catchments feeding a major river or a single sub catchment feeding a watercourse.

Certification: voluntary compliance to objectives and processes set by an independent certification body.

Competency: a concept that focuses on what is expected of an employee in the workplace rather than on the learning process. It embodies the ability to transfer and apply skills and knowledge to new situations and environments. Competency will normally be supported by accreditation from a recognised training authority or recognition by an appropriate professional body.

Coppice: the practice of cutting down juvenile stems at ground level that have re-sprouted from the cut stump to: stimulate growth of the remaining stems; achieve a desirable stocking in the stand; and leave a suitable number of dominant stems standing.

Cross slope: the formation of a road surface to provide a slope or camber so that water will drain from it.

Crown (in relation to a road): the highest point of a road that is shaped to allow drainage of water from it.

Declared animal: a declared animal under the *Biosecurity and Agriculture Management Act 2007*.

Declared plant: a declared plant under the *Biosecurity and Agriculture Management Act 2007*.

Disease: any disease or pathogen that attacks an animal or plant and includes any plant, fungus, bacteria, virus, nematode or other biological entity that may be found in or on a plant or animal; and genetic diseases and defects.

Drainage line: depressions that have evidence of periodically flowing water with a defined channel appearing at least intermittently. Visible water flow would be expected after storm events.

Erosion hazard: a circumstance likely to increase the potential for erosion.

Establishment: a period of **plantation** development during which **site preparation**, weed control, planting, fertilising, infill planting and seedling protection takes place. Nominally, this is a period up to two years.

Exotic: introduced, not native to the area.

Extraction track: usually a **temporary track** used to haul wood products out of the **plantation area** to a landing area.

Field specification: the formal field specifications developed following appropriate consultation between the owner or manager of a **sensitive property**, the owner of the **target property** and the **pilot** engaged by the aviation contractor for application of **pesticides** on the target property to ensure protection to a neighbouring sensitive property.

Field supervisor: an employee or representative of the owner of the **target property** who is responsible for supervising and coordinating the aerial spray operation in the field. The field supervisor maintains sole communication with the **pilot** and acts as ground observer during the operation.

Filter strip: a piece of well vegetated land used specifically to filter out sediments and specific chemicals from water before entering a water body.

Fire management plan: specified procedures for preventing and controlling fires in a **plantation**.

Flume: an artificial channel of non-erodible material located below a culvert to prevent erosion of the **batter**.

Harvest residue (logging debris): non-merchantable material that remains on a site after harvest operations.

Hygiene: biosecurity actions that decrease the risk of undesirable **pests**, **diseases** and weeds from being introduced, enabled to survive, spread or intensified.

Incident: An incident involves a significant chemical, oil or fuel spill in a place of environmental sensitivity or where there are implications for human health. An incident may also be a serious accident, an **exotic pest**, **disease** or weed incursion or natural disaster.

Incident management plan: a plan that details the procedure to minimise any detrimental impact of an **incident**.

Incursion response: A measured response to control an invasive introduced plant and/or pest in the interest of maintaining biosecurity.

Integrated pest management: is a broad-based approach that integrates a range of practices for the economic control of **pests**.

Integrated weed management: is a broad-based approach that integrates a range of practices for the economic control of weeds.

Native vegetation: native vegetation with an indigenous understorey.

Native vegetation (clearing of): to clear means to cause or permit the indigenous undergrowth, bush, or trees on the land to be removed or destroyed, or so damaged as to eventually be destroyed, or to cause the removal from the land of vegetation not under cultivation.

Neighbour: a landowner with a common boundary to the **target property** or who is situated adjacent to the target property. This may not necessarily be the owner of a **sensitive property**.

Permanent road: a formed road located within a **plantation** that is required over the life of the plantation.

Pesticide: substances meant for attracting, seducing, destroying or mitigating any pest.

Pests: includes insects, weeds, fungi and animals that are declared or those that may cause damage to **plantations**.

Pilot: the pilot of the aircraft engaged to apply the **pesticides** on behalf of the **aerial spraying contractor**.

Plantation: a stand of trees of ten hectares (or as defined by the Local Government Authority), or larger, that has been established by sowing or planting of either native or **exotic** tree species selected and managed intensively for their commercial and/or environmental benefits. A plantation includes roads, **tracks**, and firebreaks.

Plantation area: that part of a **plantation** that is established to plantation trees.

Plantation establishment: the act of creating a new **plantation** whether it is by the planting of seedlings, clonal material or through the management of coppice shoots originating from a previous crop.

Plantation harvest plan: a plan developed before harvesting a **plantation** detailing the time of harvest, procedure for harvesting (including measures to protect local environmental and social values) and the route by which the products will be transported to a processor

Plantation management activities: all those acts undertaken in order to properly regulate and control the growth and harvesting of the **plantation**.

Plantation management plan: specified details of the development and management of a **plantation**. A plantation management plan may include **plantation maps, establishment, maintenance, and fire management procedures**. (Refer to Appendix 1.)

Plantation manager: the person or organisation that has responsibility for the implementation and control of all aspects of **plantation** management.

Plantation map: a map that details location of compartments on a property, cadastral and topographical features, infrastructure, firebreaks, water points, power lines, entry points and permanent access roads and **tracks**

Prescribed pest plant: a pest plant prescribed by Local Government under section 193 of the BAM Act.

Private land: freehold land.

Public drinking water source area (PDWSA): existing and future drinking water sources, identified by proclaiming underground **water pollution** control areas, water reserves or **catchment** areas under the *Country Areas Water Supply Act 1947* or the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*.

Public land: land not granted or contracted to be granted in fee simple.

Public road: a sealed or unsealed trafficable roadway that is the responsibility of a local government or Main Roads Western Australia (MRWA).

Raw water: surface or groundwater to be used as drinking water but which has not received any treatment.

Reversion: the change of **plantation** land back to an alternative use.

Rehabilitation: the restoration and revegetation of a site disturbed by **plantation** activities.

Reservoir: an artificial construction in the landscape for containing water.

Riparian zone: the zone adjacent to or surrounding a water body where **riparian vegetation** and natural ecosystems benefit from and are influenced by the passage and storage of water.

Riparian vegetation (phreatophytic vegetation): **vegetation** growing in a **riparian zone**. This vegetation relies on near-surface groundwater or seasonal inundation to survive.

Road manager: the entity with the legal responsibility for managing the roadway.

Rock spillway: a placement of rocks below a culvert outlet designed to prevent erosion of the **batter**.

Rotation: a planned period of years between the planting of a **plantation** and its harvesting.

Run-off (related to road construction): a short, graded channel angled away from a road designed to divert water from the road into undisturbed ground.

Sensitive property: a property on which there is sensitive environmental value (e.g. a water supply source or conservation-valued water body) or a registered commercial activity that is sensitive to exposure to **pesticides**. For example, commercial marron farms, commercial fish farms, commercial vineyards, commercial strawberry farms or organic farming enterprises.

Significant value: a place of recognised natural, historic, cultural or environmental importance.

Silviculture: the theory and practice of managing **plantations** for wood production.

Site preparation: the preparation of a site in order to establish a **plantation**.

Soil damage: where the 'A' soil horizon (topsoil) is mixed with the 'B' horizon (subsoil usually containing clay) and/or severe compaction occurs. (This normally means compaction that will affect germination or plant growth.)

Soil disturbance: where the 'A' soil horizon (topsoil) is wholly or partly removed.

Specifications: detailed methods that are developed to suit regional requirements and specific conditions to achieve a nominated goal.

Stringers and girders: beams or logs used to form the span of a bridge.

Target property: a property for which an aerial spraying operation has been prescribed with the Aerial Spray Application Management Plan in Appendix 3.

Temporary track or road: a road constructed within the **plantation** specifically for use in a particular operation. The road is usually not formed or surfaced and is closed after the operation is complete.

Tending: the treatment of a **plantation** to maintain, improve and protect the stand.

Thinning: the removal and/or killing of a portion of the trees in a **plantation** to procure a specific product and/or to increase the growth rate on selected retained trees.

Track: a **permanent road** that is not surfaced and that provides access to a **plantation** for **tending**, fire-related activities and extraction.

Vegetated buffer: an area of land adjacent to the planted area of a **plantation** on which native or other **vegetation** is retained for environmental purposes.

Vegetation: plants of any kind.

Watercourse: is defined in the *Rights in Water and Irrigation Act 1914* (as amended) as:

- a) any river, creek, stream or brook in which water flows;
- b) any collection of water (including a **reservoir**) into, through or out of which anything coming within paragraph (a) flows; or
- c) any place where water flows that is prescribed by local by-laws to be a watercourse.

This includes the bed and banks of anything referred to in paragraphs (a), (b) or (c).

Water pollution: when waste products or other substances (e.g. effluent, litter, refuse, sewage or contaminated runoff) change the physical, chemical, biological or thermal properties of the water, adversely affecting water quality, living species and beneficial uses (*National Water Quality Management Strategy 1994*).

Water quality values: are those values that pertain to the purity of the water and which can be adversely affected by environmental contaminants.

Wildlings: wildling is an **Exotic** plant growing outside of the managed area.

Wetland: area of seasonal, intermittent or permanent waterlogged soils or inundated land, whether natural or otherwise, fresh or saline. In the context of the Code of Practice, however, the types of wetlands that require consideration are Ramsar Convention¹, Australian Nature Conservation Agency's Directory of Important Wetlands in Australia², National Estate listings³, Conservation Category or Resource Enhancement⁴ wetlands. The recommended management measures in this Code do not apply to multiple use wetlands. For more information contact the Department of Parks and Wildlife (DPaW) and/or the Department of Water regional office for management categories, boundaries and locations of wetlands.

References

1. UNESCO 1971, Article 1, Part 1, *Convention on Wetlands of International Significance*. Published in Australia, 1976, for Department of Foreign Affairs, Australian Government Publishing Service, Treaty Series 1975, No 48.
2. Usback, S. and James, R. (eds.) 1993, *A Directory of Important Wetlands in Australia*, Australian Nature Conservation Agency, Canberra.
3. Australian Heritage Commission 1990, *Criteria for the Register of the National Estate*, Australian Heritage Commission Background Notes.

4. EPA. 1993. *A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area*. An Update to EPA Bulletin 374. Perth, Western Australia.

Acronyms

AFG	Australian Forest Growers
AFS	Australian Forestry Standard
CAWS	Country Areas Water Supply
CPWA	Commercial Plantations Western Australia
DAFF	Department of Agriculture, Fisheries and Forestry
DAFWA	Department of Agriculture and Food
DER	Department of Environment Regulation
DFES	Department of Fire and Emergency Services
DoE	Department of Environment
DoH	Department of Health
DoW	Department of Water
DPaW	Department of Parks and Wildlife
EPA	Environmental Protection Authority
FIFWA	Forest Industries Federation (WA)
FPC	Forest Products Commission
FSC®	Forest Stewardship Council®
GSP	Great Southern Plantations
MRWA	Department of Main Roads Western Australia
MWSS&D	Metropolitan Water Supply, Sewerage and Drainage
PDWSAs	Public drinking water source areas
SDAZs	Spray drift awareness zones

Section 1: Scope of the Code of Practice

1.1 Introduction

The **plantation** estate in Western Australia is comprised of over 300,000 hectares of hardwood plantations, primarily Tasmanian blue gum (*Eucalyptus globulus Labill*) located in areas extending from south of Perth to Albany and over 80,000 hectares of *Pinus radiata* and *P. pinaster* plantations located in areas extending from north of Perth to Esperance in the south east. In addition to the large-scale plantations, there are large areas of other commercial tree plantings across all regions of WA, several species of which produce or were planted for non-wood products such as oil, nuts, carbon credits and biomass.

The sector contributes significantly to the economy, the environment and provides social benefits to local communities. The economic benefits include: greater employment opportunities; investment opportunities; and greater diversity in rural economies. Environmental benefits of the sector include: improved land use planning and natural resource management; improvement/management of water quality; removal of carbon dioxide from the atmosphere; managing water and wind erosion; shelter for animals and stock; and the protection and enhancement of biodiversity. Social benefits include: workforce education and training; recreational opportunities; promotes regional population growth; increases employment opportunities; and creates a more diverse and resilient community.

Tree **plantations** in Western Australia have an important role in providing a sustainable resource for economic development, as well as providing a means of improving farmland degraded by salinity and erosion caused by over-clearing.

Plantings commonly referred to as *agroforestry* or *farm forestry* are included within the definition of **plantations** within this Code of Practice for Timber Plantations in Western Australia (Code).

Plantations offer a valuable resource, in addition to wood sourced from native forests, for the supply of forest products to both domestic and international markets.

The purpose of this Code is to provide goals and guidelines to **plantation managers** so that **plantation** operations in Western Australia are conducted in a manner that is in accordance with accepted principles for good plantation management, whilst recognising that a primary aim of plantations is to be economically competitive and sustainable. Principles for good plantation management are described in *Forest Practices Related to Wood Production in Plantations: National Principles (1996)* and *National Water Quality Management Strategy: Policy and Principles (1994)*.

Achieving the goals and observing the guidelines defined in this Code are tasks for all parties associated with a particular **plantation**. These parties may include the owner of the land on which a plantation is growing, the owner of the plantation, the manager of the plantation, and the employees and contractors employed to work in the plantation. Key responsibilities will generally rest with the **plantation manager**.

The function of the Code may be summarised as follows:

- The Code is a guide for the development of **plantation management plans** that form the basis of **plantation management activities** including, **tending**, fire management and harvesting operations.
- The Code does not include detailed prescriptions for works. It is acknowledged that these should generally reflect individual objectives and circumstances. Prescriptions also vary between growers and are contingent on individual **plantation** characteristics, these being the responsibility of individual **plantation managers**.
- The Code applies to both public and private plantation growers on all land tenures.
- The Code has been consolidated by the Forest Industries Federation (WA) FIFWA through extensive consultation and involvement with industry stakeholders. It is based on earlier versions of the Code produced by Australian Forest Growers WA (AFG) and Commercial Plantation WA (CPWA).
- This Code is not a prerequisite of quality or environmental management systems, or the reverse. The Code is designed to complement such systems.
- The term *must* is used to indicate a legislative or regulatory requirement or a core requirement of the Code. The term *should* is used to indicate a desirable but not mandatory procedure.

1.2 Land Ownership and Management Arrangements

There are a number of ownership arrangements within the **plantation** industry in WA. These range from an entity being the landowner, plantation owner and **plantation manager** through to there being a separate entity for each. Often these arrangements are secured by legally binding contracts. An example of such ownership and management arrangements exist between the State agencies - Department Parks and Wildlife (DPaW) and Forest Products Commission (FPC).

The FPC is responsible for the harvest and reestablishment of **plantations** on land managed by DPaW. Management activities in these plantation areas are subject to specific requirements in accordance with the *Conservation and Land Management Act 1984* and *Forest Products Act 2000*, as well as, DPaW policies, guidelines and management plans and inter-agency agreements applicable to these lands.

1.3 The Need for a Code of Practice

The purpose of this Code is to provide goals and guidelines to **plantation managers** so that operations in **plantations** in Western Australia are economically competitive and sustainable and are consistent with other resource management objectives.

The Code also facilitates assessment of State timber **plantation** practices by the Australian Government. This was a prerequisite to ensure that controls on the export of unprocessed wood from public and private plantations are removed.

The Western Australian Planning Commission and local town planning schemes can rely upon the adoption of, and adherence to, this Code by **plantation managers** as an integral part of the planning and land-use process, whether or not formal planning approval is required.

Local governments can rely on adherence to this Code where planning approval for the **establishment** of a **plantation** is not required under a town planning scheme (i.e. is a permitted land use).

Compliance with this Code will provide:

- the **plantation** industry with confidence to secure export opportunities for plantation products without additional licences or approvals;
- **plantation managers** with a single reference document encompassing all relevant rules and regulations relating to **plantations** in Western Australia; however, plantation managers should be aware that this Code might not reflect the current status of regulations as they may change over time;
- increased confidence for investors dealing with **plantation managers**;
- a professional, credible and sustainable industry by establishing the framework within which growers can apply best practice; and
- an environmentally conscious market with sustainably produced wood or wood derived products.

1.4 Changes to the Code

Any changes to this Code must be done through the consultative process established to produce this document.

Formal committee structures established within industry will be the forums for any changes or recommendations to this Code.

In considering changes to the Code during a review process, FIFWA will consider the views of the following interest groups in respect of adopting any updates:

- the **plantation** growers, harvest contractors and processors;
- growers, industry and relevant regional-planning groups;
- relevant government agencies; and
- local government authorities.

This is the first revised edition of the Code since its initial publication in 2006. Changes made to this Code are not intended to be applied retrospectively to existing **plantations**. The Code complements related Acts, regulations, management plans, and other relevant codes of practice, State policies, local government planning schemes, and State and national statements that relate directly or indirectly to plantations.

This revised edition of the Code *does not cover* the management of native forests, plant nurseries or seed orchards.

This Code will take effect from the date of its publication and will be reviewed by FIFWA every five years or as required.

1.5 Breaches of the Code

Any alleged breaches of the Code should, in the first instance, be referred to the plantation's owner or manager for attention. This should be done by the local government authority or government agency with authority under a relevant Act, regulation or planning scheme.

Where a written referral has been made, the **plantation** owner or manager has an obligation under this Code to respond to the notice within a reasonable timeframe.

Alleged breaches that relate to a failure to comply with Federal or State law that are not rectified within a reasonable timeframe following a notice issued by a local government authority or other government agency, should be referred to the relevant government agency for attention.

The **plantation** owner or manager may address an alleged breach that is referred to them by providing the relevant agency with a notice of response and following rectification action, if required, a Certificate of Compliance that the alleged breach has been dealt with and that the development is compliant or has been brought into compliance with the Code.

Compliance **certification** can be obtained by the **plantation** owner or manager providing a certificate from one of the following entities:

1. An internal audit carried out by accredited auditors in response to the alleged breach.
2. An external independent audit carried out to satisfy compliance with relevant Federal or State legislation. For example, the *Management Investment Act 1988*, if applicable.
3. Independent **certification** undertaken by a person who is duly qualified to provide certification of compliance.

Where compliance is subsequently certified by one of the above entities and provided to the relevant government agency, no further action is required.

1.6 Documentation of Operational Procedures

Plantation managers with a resource in excess of 1,500 planted hectares should develop internal written procedures based on the goals and guidelines of this Code.

Section 2: Plantation Management Principles

This Code is guided by various national and general principles. It has been established to provide a framework for a consistent and scientific approach to sustainable management of **plantations**.

2.1 National Principles

The *National Principles in Forest Practices Related to Wood Production in Plantations: National Principles* (March 1996) are reproduced verbatim in the italicised text below.

Wood production is an accepted major commercial use of Australia's forests and is the primary purpose for establishing and managing plantations. In addition, plantations can provide a range of commercial, environmental and aesthetic benefits to the community.

In pursuing a vision of ecologically sustainable management of Australia's forests, Australian Governments, through the National Forest Policy Statement, have enunciated a national goal for plantations:

"to expand Australia's commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high quality wood resource to industry".

In this context, the establishment of plantations for wood production should be determined on the basis of economic viability and international competitiveness, and market forces should determine the extent of resource use and the nature of industry operations. In essence, plantations established for wood production should be treated in the same way as any agricultural productions.

To achieve greater investment in plantations, it will be necessary to ensure that the impediments to plantation development are minimal, that clear and consistent policies for resource development are established across all levels of government and that there is security of access to established resources. Provided that social and environmental objectives are met, Governments will keep regulations to a minimum. For example, the Commonwealth will remove controls over the export of unprocessed public and private plantation wood subject to the application of codes of practice to protect environmental values. Furthermore, it is not intended that controls be imposed on the plantation industry that would not apply to other agricultural activities.

In accordance with the National Forest Policy Statement, the Ministerial Council on Forestry, Fisheries and Aquaculture, representing the States and the Commonwealth's forestry authorities, has prepared this statement of national principles to be applied in the management of plantations.

These principles set the framework for a consistent and scientific basis for sound plantation management to which all States and Territories subscribe. Codes of

practice for plantations, conforming to the national principles, will be developed by the States and Territories taking into account the range of plantation types, conditions and situations applying due to natural and cultural variations. Several States and Territories already have such codes in place.

The principles have been structured into several sections relating to different activities associated with plantation production. The principles apply to both public and private plantations.

2.1.1 Principles of Environmental Care

- a. Native forest should not be cleared for plantation establishment where this would compromise regional conservation and catchment management objectives. In some circumstances it may be appropriate to clear forests that have been severely degraded by impacts such as disease, weed invasion, wind and fire so as to enable rehabilitation through replanting.*
- b. Values such as intensive recreation, high scenic quality, significant geomorphic, biological, or cultural heritage sites, should be recognised in the planning of plantation forest operations.*
- c. Plantation management should comply with State and regional conservation and catchment management objectives, relevant planning schemes and legislation.*
- d. Water quality (physical, chemical, or biological) should be protected by measures controlling change resulting from plantation activities*
- e. Water yield should be managed as required by careful planning of operations.*
- f. Soil stability should be protected by measures, which regulate site disturbance.*
- g. Soil, water catchment, cultural and landscape values should be protected by the careful location, construction, and maintenance of roads and tracks, and regulation of their use.*
- h. Fauna, floristic, and landscape values should be protected by the careful planning of plantation layout establishment operations and the reservation and protection of appropriate areas of native vegetation; such values should be recognised in subsequent plantation management.*
- i. Plantations and adjacent native forests should be protected from the adverse effects of fire and from the introduction and spread of plant, insect and animal pests and plant diseases.*
- j. Operators will be trained in the principles of environmental care.*

2.1.2 Safety

All plantation establishment, management and utilisation activities will be conducted to comply with relevant occupational health and safety legislation and policy. In particular, all operators should be trained to designated standards in the safe and efficient use of equipment and machinery, and be responsible for safe working practices.

2.1.3 Planning

State and Local Governments should, with appropriate public involvement, pursue planning policies that provide secure zoning for commercial planting with the objective that tree planting and subsequent harvesting for commercial wood production should be an 'as of right' use.

State Governments will establish a sound legal basis for separating the forest asset component from the land asset for tree plantings. The Commonwealth Government will consider similar action re taxation, capital valuation etc.

Plantation strategic planning should be developed in conjunction with regional development plans.

The environmental, social and economic effects of all plantation operations envisaged for an area will be considered during the planning process.

Individual plantation operations will be conducted in accordance with relevant codes of practice.

2.1.4 Access

Planning of road systems in plantations should be based on both the economic principle of minimising the combined cost of roading and extraction and on the Principles of Environmental Care.

Road design will be to standards consistent with the purpose for which the road is to be used, and capable of carrying the anticipated traffic with reasonable safety.

Construction and maintenance of roads and associated works will be undertaken in a manner, which will ensure compliance with the Principles of Environmental Care.

Roads will be closed in wet conditions when unacceptable damage would occur or when such other conditions may warrant.

2.1.5 Establishment and Maintenance

Plantation establishment methods should be economically and environmentally appropriate for the particular requirements of the species to be planted and the specific site conditions.

Establishment of plantations may involve introduction of selected species, provenances or populations to increase productivity or value. However management of these plantations should aim to constrain or prevent the introduction of these species into surrounding areas.

Intensive management practices, such as site preparation, fertilising, weed control, pest and disease control and other operations will be carried out in accordance with codes of practice, and consistent with the Principles of Environmental Care.

2.1.6 Timber Harvesting

Timber harvesting will be planned and carried out under codes of practice to meet the Principles of Environmental Care.

The harvesting plan will consider factors such as harvesting unit size, slope and location of harvesting units; design and location of landings and snig tracks; harvesting equipment; areas excluded from logging; and areas specified for protection and reforestation.

Harvesting operations should not be conducted in a manner which compromises the Principles of Environmental Care, or where the safety of workers is at unacceptable risk.

Soil and water values should be protected by progressive rehabilitation and drainage of snig tracks, temporary roads, log dumps and any other earthworks associated with harvesting operations.

2.1.7 Forest Protection

Fire protection planning should be undertaken on a regional basis in co-ordination with relevant land management agencies and with local bush fire control organisations.

Plantation health surveillance should be undertaken on a regular basis.

Where weeds, pests or diseases cause significant damage, decline, or deaths of trees, prompt specialist advice should be sought to address the problem.

Use of chemicals, such as herbicides and pesticides, and other pest control methods in plantation operations will be in accordance with State policies, procedures and approved usage.

2.1.8 Monitoring and Review

Where practicable, plantation operations should be supervised and monitored by qualified persons and be subject to audit.

2.2 General Principles

2.2.1 Economic Benefits of Plantations

The economic viability of **plantations** and the ability to meet national and regional goals for plantation timber products will depend, in part, on the scale of investment in the plantation industry. Likewise, confidence is influenced by return on investment as well as the security of the investment, both of which can affect the scale and viability of the industry.

The development and sustainability of **plantations** is therefore contingent on the inherent economics of the industry. It is influenced by costs of production as well as plantation productivity.

The contribution to employment and the social fabric of local communities is likely to increase as the **plantations** mature and generate further harvesting, processing and value-adding opportunities.

It is therefore important to ensure that this Code maintains a careful balance between economic, environmental and social factors in considering issues relevant to the plantation industry.

2.2.2 Social Benefits of Plantations

Plantations provide many social benefits to the communities that regularly interact with and depend on them, particularly regional communities.

Workforce education and training, recreational activities, conservation activities, regional population growth, employment opportunities and a more diverse and resilient community are some of the common benefits associated with plantations.

2.2.3 Environmental Benefits of Plantations

This Code recognises the benefits that **plantations** provide as a means of reversing land degradation such as salinisation and improving **water quality**.

In particular, it is important to recognise the multiple benefits that plantations can provide in relation to environmental and commercial objectives, through the integration of plantations with other agricultural systems.

2.3 Water Resources and Salinity

There are a variety of land and environmental benefits associated with tree planting that have the potential to contribute to the security and quality of water resources, and in particular, to contribute to the State Government's objectives on salinity management.

The **establishment** of **plantations** on cleared farmland complements the objectives of the State Government's salinity strategy, in particular the promotion of tree planting for the control of groundwater levels.

If located and managed appropriately, **plantations** can benefit water resources by:

- improving **water quality** in **catchments** affected by saline surface water; e.g. the Denmark River catchment;
- addressing dryland salinity and assisting in the control of soil erosion;
- reducing nutrient inputs compared to other crops; and
- reducing applications of **pesticides** in comparison to general agriculture.

2.4 Certification

Certification is essentially concerned with demonstrating conformance to an independent certification body to a set of documented requirements. In this context the requirements deal with the management of forests for the production of forest products both wood and non-wood. Certification is a voluntary choice made by many forest growers driven in the main by the requirements of international markets.

Forest growers in Australia seeking to certify that their forests are well managed are faced with a choice of two primary standards. They can certify their forests using the Forest Stewardship Council® (FSC®) requirements or the Australian Forestry Standard (AFS). The Schemes are not equivalent.

Both schemes require forest growers to demonstrate to independent auditors that they are aware of all relevant laws and that their practices comply with such laws. Forest growers in Western Australia are encouraged to use this Code as a basis for demonstrating to auditors an awareness of relevant laws and the practical application of such laws.

The internationally recognised standard for environmental management is ISO14001. Organisations can seek **certification** against this standard by accredited third party certifiers. However, no product claims can be made on the basis of certification against this standard. Therefore it is not widely used in the forest industry.

2.4.1 FSC® Certification

The FSC® is an organisation with the stated purpose of improving forest management worldwide by establishing consensus on what good forest management means¹. The primary document used to verify if an organisation responsible for forest management is conducting good forest management is the FSC Principles and Criteria², which specifies 10 principles and supporting criteria.

These principles and criteria apply internationally to all types of forests irrespective of factors such as size, forest type, location or ownership arrangements.

2.4.2 AFS Certification

The AFS is a standard accredited by the Standards Accreditation Board of Standards Australia, which specifies nine criteria and supporting requirements³. The AFS is administered by the Australian Forestry Standard Limited (AFSL)⁴ which is a not-for-profit public company registered in July 2003.

Following the development and accreditation of the AFS, AFSL sought and obtained mutual recognition of the AFS from the global Programme for the Endorsement of Forest Conformance schemes (PEFC) to enable the international trade of timber products from AFS certified forests. The PEFC is an international non-profit, non-governmental organisation dedicated to promoting sustainable forest management⁵.

¹History-Forest Stewardship Council, www.fsc.org/history.html

²http://www.fsc.org/fileadmin/web-data/public/document_center/international_FSC_policies/standards/FSC_STD_01_001_V4_0_EN_FSC_Principles_and_Criteria.pdf

³Australian Standard AS4708-2007: The Australian Forestry Standard.

⁴<http://www.forestrystandard.org.au/12about.asp>

⁵<http://www.pefc.org/index.php>

2.4.3 Product Labelling

Both **certification** schemes have rules about how forest products (wood and non-wood) harvested and/or produced in certified forests must be handled after they leave the ownership or control of the forest manager in order to carry a label and make claims about the quality of forest management associated with their production. Processors of forest products who want to apply products labels must also be assessed and certified to ensure the way they handle forest products from certified forests is in compliance with these rules.

Both standards include rules for the sales of:

- wood that is 100% certified,
- a mix of certified wood and non-certified wood that has been assessed through a verification process that the products have been harvested legally and the key principles of conformance to the relevant schemes has been satisfied.

2.5 Significant Values

An integral part of forest management is the managing of any significant environmental and social values that may occur on plantations. Significant values can include threatened animals, plants and ecosystems; Indigenous and European heritage sites; protected water sources; and large landscape level forests.

Initially these values are identified pre establishment using various sources such as the Species Profile and Threats Database; Nature Map; Aboriginal Heritage Inquiry System; and extensive stakeholder input. Similar searches are also undertaken pre harvest. Subsequently management and monitoring regimes are established in consultation with the relevant stakeholders and documented in **plantation** company systems.

Areas of value will be managed and monitored in accordance with individual **plantation** company requirements and protocols. Management may include **pest** and **disease** control programs; **rehabilitation** and restoration projects; fencing and stock exclusion; establishment of **buffer** and exclusion zones; and prescribed burning.

Section 3: Acts, Regulations and Key Reference Documents Relevant to Plantation Management

Legislative controls and guidelines on **plantation management activities** in Western Australia are found in relevant Australian Government and State Acts and regulations along with the associated policies, guidelines and related codes of practice. The following table lists these documents along with their jurisdiction, its relevance to the **plantation** industry and the responsible agency.

On land managed by DPaW, activities in **plantation areas** are subject to specific requirements in accordance with the *Conservation and Land Management Act* and *Forest Products Act* as well as DPaW policies, guidelines and management plans and inter-agency agreements applicable to these lands. These documents are not listed in the following table.

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
1. Aviation				
a	Civil Aviation Regulations (various)	Australian	Limitations on obstacles surrounding airstrips. Limitations on construction of airstrips or runways within five nautical miles of existing aerodromes.	Civil Aviation Authority
2. Biosecurity				
a	<i>Animal Welfare Act 2002</i>	State	Prohibits inhumane and improper treatment of animals. Ensures proper care of animals within generally accepted standards. Reflects the community's expectation that animals will be properly treated.	DAFWA
b	<i>Biosecurity and Agriculture Management Act 2007</i>	State	Prevents the introduction and spread of animal and plant pests and diseases . Manages the usage of chemicals in response to pests and weeds.	DAFWA
c	<i>Exotic Diseases of Animals Act 1993</i>	State	The eradication of major exotic animal diseases .	DAFWA

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
d	National Plant Biosecurity Strategy	Australian	A 10-year vision that aims to maintain and improve biosecurity to help keep Australia free from many pests that affect plant production, the natural environment and economies overseas.	Plant Health Australia
e	<i>Plant Diseases (Regulations) Act 1968</i>	State	Regulates the movement of plant species and timber products into Western Australia from interstate and within the state.	DAFWA
f	<i>Quarantine Act 1908 and the Customs Act 1901</i>	State	Import of plants and forest products into Western Australia from overseas.	Australian Quarantine and Inspection Service
3. Carbon				
a	<i>Carbon Rights Legislation Act 2003</i>	State	Recognises the rights associated with carbon sequestration and claiming of carbon credits.	Department of Environment Regulation (DER)
4. Cultural heritage				
a	<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	Australian	Assists in the preservation and protection of places, areas and objects of particular significance to Indigenous Australians.	Department of Environment (DoE)
b	<i>Aboriginal Heritage Act 1972</i>	State	Protects Aboriginal cultural material, Aboriginal sites and declared protected areas.	Department of Indigenous Affairs
c	<i>Australian Heritage Council Act 2003</i>	Australian	Repealed and replaced by the 2003 Act. Assesses whether a place should be included in the National Heritage List or Commonwealth Heritage List or the Register of the National Estate.	Australian Heritage Council
d	<i>Heritage of Western Australia Act 1990</i>	State	Protects places of significant cultural heritage.	Western Australian Heritage Commission

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
5. Environment				
a	<i>Conservation and Land Management Act 1984</i>	State	Sets objectives for plantations on State forest and timber reserves, State managed business undertakings for tree plantations including timber share farming agreements, registration of owner's identification code for private land and log timber intended to be delivered to a sawmill.	DPaW
b	<i>Contaminated Sites Act 2003</i>	State	Aims to protect people's health and save the environment from harm. Contaminated sites must be reported to the DER, investigated and, if necessary, cleaned up.	DER
c	<i>Environmental Protection Act 1986 (EP Act)</i>	State	Environmental impact assessment of any proposals that may significantly affect the environment may be required. Provides environmental protection policies and pollution prevention via various regulatory processes.	DER
d	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>	Australian	Environmental impact assessments for proposals that may significantly affect a matter of national environmental significance, or for Commonwealth proponents or on Commonwealth lands. Defines threatened species and communities and threatening processes.	DoE
e	Environmental Protection Regulations 1987	State	Provide further detail on the administration and enforcement of licences and licence conditions, including monitoring requirements.	DER

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
f	Environment Protection (Clearing of native vegetation) Regulations 2004	State	The <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i> replaces the existing law relating to clearing under the <i>Soil and Land Conservation Act 1945</i> . Examples of clearing that will require a permit are paddock trees greater than a hectare and any native vegetation in public-drinking-water source areas (PDWSAs) .	DER
g	Environment Protection (Unauthorised Discharge) Regulations 2004	State	Makes it an offence to discharge some common substances without approval, including heavy metals, highly acidic or alkaline solutions, dust, hydrocarbons, sediment, sewage, and visible smoke from burning things such as carpet, preserved timber or paint.	DER
h	Intergovernmental Agreement on the Environment 1992	Australian	Aims to facilitate a cooperative national approach to the environment and better environment protection ⁶ .	DoE
i	<i>Soil and Land Conservation Act 1945</i>	State	The conservation of land resources and the mitigation of the effects of salinity, erosion and flooding. Drainage and pumping of water from owner's land to other land or water course.	DAFWA
j	<i>Wildlife Conservation Act 1950</i>	State	Issue of damage licences for management of native fauna damaging plantations , taking of protected flora and fauna, protection of rare flora and fauna. Taking of protected flora for sale from private property requires a commercial producer's licence.	DPaW
6. Fire				

⁶Department of Environment (2010). Intergovernmental Agreement on the Environment, <http://www.environment.gov.au/about/esd/publications/igae/index.html>

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
a	<i>Bush Fires Act 1954</i>	State	Determines plantation design, compartment size and layout, firebreak design and minimum firebreak widths, water point requirements, fire equipment requirements, public utility firebreak easements, burning off, restricted and prohibited burning seasons, permit to set fire to bush, plantation pruning and overhang, planting within town site influence zones, declaration of Total Fire Bans. Stipulates fire fighting equipment requirements. Declaration of Harvest and vehicle movement bans.	DFES
b	Guidelines for Plantation Fire Protection	State	Provides both local government and the plantation industry with a set of best practice fire protection standards for plantations that aim to protect human life and local community interests while minimising fire risk to plantation assets.	DFES
c	Minimum fire season requirements for Working in WA Plantation Forestry	State	Outlines minimum fire season requirements.	FIFWA
7. Harvesting and transport				
a	Safety and Health Code for Native Forest/Hardwood Logging and Plantation Logging	State	Promotes safety and health of people at work in logging operations.	FIFWA

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
b	FIFWA Road Haulage Code of Conduct	State	This code of conduct prevails in every aspect of the haulage of forest and plantation products.	FIFWA
c	<i>Road Traffic Act 1974</i>	State	An <i>Act</i> to make further provision with respect to <i>road traffic</i> and operators' licences, and for connected purposes.	Department of the Premier and Cabinet
8. Hazardous substances and dangerous goods				
a	<i>Dangerous Goods (Transport) Act 1998</i>	State	Ensures the safe transportation of dangerous goods by vehicles, and the licensing of vehicles and people responsible for the transport of dangerous goods.	Department of Mines and Petroleum
9. Land and planning				
a	<i>Dividing Fences Act 1961</i>	State	Adjoining land owners are required to share the cost of erection and maintenance of dividing fences. The Act provides the process for owners of land to serve notices for erection and maintenance of fences, the means of recovery of costs, and the formula for cost sharing between tenants and landlords.	DAFWA
b	<i>Land Drainage Act 1925</i>	State	An Act to provide for the drainage of land, the use of drains and drainage water, and the constitution of drainage districts for other purposes.	Department of Water (DoW)
c	National Forest Policy Statement (1992)	Australian	A policy statement that if signed by a plantation company commits them to the sustainable management of all Australian forests, whether the forest is on public or private land , or reserved or available for production.	DAFWA

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
d	Plantations for Australia – The 2020 Vision (2002)	Australian	A document launched in 1997 with a vision to treble Australia's plantation industry to three million hectares by the year 2020 in an effort to improve regional wealth and international competitiveness.	Australian Government
e	<i>Planning and Development Act 2005</i>	State	Preparation and administration of district planning schemes and scheme amendments to incorporate zones, provisions, policies and strategies relevant to timber plantations . (Schemes and amendments are prepared by local governments, assessed by the Western Australian Planning Commission and approved by the Minister for Planning). Approval for subdivision or for the lease of portions, lots or locations for periods in excess of ten years on freehold land is done by the Commission. Assessment of development applications for plantation establishment (where required under the district planning scheme) is done by the local government.	Western Australian Planning Commission
f	<i>Tree Plantation Agreements Act 2003</i>	Australian	An Act to provide for the making and effect of certain agreements and for the creation and effect of certain interests in land, in relation to tree plantations and related matters.	DAFWA
10. Native Title				
a	<i>Native Title Act 1993</i>	Australian	Defines procedural rights for native title.	Department of Indigenous Affairs
11. OSH				

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
a	<i>Occupational Safety and Health Act 1984 (s19, s23I)</i>	State	Employee and employer obligations and duties relating to safety, training and workplace practices.	Department of Commerce
b	Occupational Safety and Health Regulations 1996	State	Employee and employer obligations and duties relating to specific health and safety.	Department of Commerce
c	<i>Workplace Relations Act 1996</i>	Australian	Provides a minimum set of terms and conditions for employment for example classification of employees, hours and work and rate of pay.	Department of Employment and Workplace Relations
12. Pesticides and spraying				
a	<i>Aerial Spraying Control Act 1966</i>	State	Controls the spraying of agricultural chemicals including the regulation of contractor procedures, spray drift and equipment requirements.	DAFWA
b	<i>Agricultural and Veterinary Chemical Code Act 1994</i>	Australian	Provide for the evaluation, registration and control of agricultural and veterinary chemical products.	Department of Agriculture, Fisheries and Forestry (DAFF)
c	<i>Agricultural and Veterinary Chemicals (Western Australia) Act 1995</i>	State	The Act covers the use and control of pesticides , including the requirement to use pesticides in accordance with label requirements or 'off label' permits for unregistered pesticide .	DAFWA
d	Guide to the Use of Pesticides in Western Australia	State	Sets out the legislative requirements for the safe and effective use of pesticides in WA, and the policies and practical guidance on how to comply with the legislation	DoH

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
e	<i>Health Act 1911</i>	State	Use and application of pesticides in plantations , from the ground or from the air, licensing of pesticide operators, transport and storage of pesticides . Restrictions on pesticide use and application techniques within PDWSAs .	DoH
f	Health (Pesticides) Regulations	State	Controls the licensing of commercial pesticide firms and pesticide operations.	DoH
g	<i>Poisons Act 1964</i>	State	An Act to regulate and control the possession, sale and use of poisons including the application and management of pesticides .	DoH
h	Safe use and management of 1080 - Code of Practice	State	Sets out the rules and guidelines for the safe management and use of 1080 products.	DAFWA
i	Statewide Policy No 2. - Pesticide use in Public Drinking Water Source Areas	State	Policy for the protection of water sources used for public drinking supply.	DoW
13. Plantations				
a	Forest Practices Related to Wood Production in Plantation: National Principles (1996)	Australian	Guidelines and practices for sustainable management of plantations .	DAFF
14. Stock				
a	<i>Local Government Act 1995</i>	State	Subdivision 4 of the Act provides for the impoundment of straying stock. Regulations have been made under this section, and local governments have the power under the Act to make local laws regarding straying stock.	Department of Local Government and Communities

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
b	<i>Stock Diseases Act</i>	State	The prevention, control and eradication of animal diseases not included in the <i>Exotic Diseases of Animals Act 1993</i> .	DAFWA
15. Training				
a	National Competency Standards, Policy and Guidelines 1992	Australian	Provides guidance on the role, development, endorsement, maintenance and review of national competency standards.	National Training Board (Australia)
16. Trading and Investment				
a	<i>Management Investments Act 1998</i>	Australian	Sets out arrangements for the registration and ongoing regulation of managed investment schemes.	Australian Securities and Investments Commission
b	<i>Trade Practices Act 1974</i>	Australian	Promotes competition and fair trading and provides for consumer protection.	Australian Competition and Consumer Commission
17. Water				
a	<i>Country Areas Water Supply (CAWS) Act 1947</i>	State	This Act covers the protection of water quality for country surface water and groundwater sources used for public drinking water supply. The regulations and by-laws only relate to proclaimed catchment areas or water reserves. The by-laws of the Act give the department, or its delegated representative, the power to take steps to protect raw drinking water sources and to control activities within catchment areas. Regulations require licences for the removal of native vegetation within proclaimed clearing control areas unless a valid permit issued under the EP Act applies	DoW

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
			and the area has not previously been compensated.	
b	<i>Metropolitan Water Supply, Sewerage and Drainage Act 1909 (MWSS&D)</i>	State	The Act covers the protection of water quality for Perth metropolitan surface water and groundwater sources used for public drinking water supply. The regulations and by-laws only relate to proclaimed underground water-pollution control areas, public drinking water source areas or water reserves. The by-laws of this Act give the DPaW, or its delegated representative, the power to take steps to protect raw water sources and to regulate activities within catchment areas.	DoW
c	National Water Quality Management Strategy	Australian	Aims to protect the nation's water resources, by improving water quality while supporting the businesses, industry, environment and communities that depend on water for their continued development. ⁷	DoE
d	Public Service Circular 88 - Use of Herbicides in Catchment Areas	State	Protects surface and ground water sources that are used as sources of water for human consumption from contamination by herbicides.	DoH

⁷Department of Environment (2013). National Water Quality Management Strategy, Available online <http://www.environment.gov.au/topics/water/water-quality/national-water-quality-management-strategy> (Accessed 16 December 2013)

Ref.	Title of Document	Government jurisdiction	Document's relevance to plantations	Responsible Agency
e	<i>Rights in Water and Irrigation Act 1914</i>	State	Covers riparian rights, irrigation districts management, the licensing of bores for aquifers and abstraction of water from rivers and watercourses and controls on certain surface waters. Licenses are only required in proclaimed areas. In addition, all artesian wells need to be licensed. Regulates the modification of naturally flowing watercourse by way of dams, weirs or reservoirs and to protect natural watercourses from pollution.	DoW
f	<i>Swan and Canning Rivers Management Act 2006</i>	State	Protection and management of rivers.	Swan River Trust
g	Vegetation buffers to sensitive water resources	State	Protecting sensitive water resources by establishing and maintaining vegetation buffers .	DoW
h	<i>Waterways Conservation Act 1976</i>	State	Under the provisions of this Act, the DoW has a waterways management and protection function and associated powers in respect of designated waterways: Peel-Harvey Estuaries; Leschenault Estuary and associated rivers; Albany Harbour and associated rivers; Wilson Inlet and associated rivers; and the Avon River.	DoW

Section 4: Goals and Guidelines for Plantation Management

4.1 Explanation

The following terms are used in this section:

- *Goal*: a desired outcome (economic, social or environmental).
- *Guideline*: a recommended approach for achieving goals. Guidelines can be either quantitative or qualitative.
- *Specifications*: detailed methods that are developed to suit regional requirements and specific conditions to achieve a nominated goal.

This Code provides goals and guidelines to follow when preparing **specifications** for **establishment, silviculture** management, harvesting and **reversion** of **plantations**.

4.2 Management Plans

Goal

Establish and manage **plantations** according to management plans.

Guidelines

- A **plantation** must be managed according to a **management plan**. A protocol is outlined in Appendix 1. As applicable, specific requirements of land owners/land managers and plantation owners should be taken into account in preparation and amendment of such plans.
- **Plantation managers** with **plantations** spread over a number of sites may develop generic plans that apply to a number of properties or areas. Where this occurs, the sites to which the generic plan applies must be clearly identified along with appropriate site-related details including the provision of **plantation maps** for the plantations.
- **Plantation maps** are dynamic and may be reviewed and updated from time to time to reflect changes in the **plantation**.
- **Plantation managers** may require town-planning approval for **plantations** before settlement and before specific management planning and mapping has been completed. This situation could arise where the land in question is in a special control area and/or is listed as a discretionary use under the relevant local planning scheme. In such cases, the plantation manager may submit a draft **plantation management plan** and **plantation map** for the purposes of gaining the necessary planning approvals.
- Management of a **plantation** over time may vary from that specified in the original **plantation management plan** to account for new techniques and procedures as well as to respond to new threats to the plantation. Changes to the plantation management plan that have the potential to impact on **water quality** in **PWDSAs** should be discussed with the regional office of the DoW (or its delegated agent).

- In a land use zone where approval to establish a **plantation** is not necessary, the **plantation manager** should submit a **plantation management plan** and **plantation map** to the relevant local government for record purposes.

4.3 Plantation Location, Planning and Design

Goals

- Locate and design **plantations** in order to achieve desired commercial, social and environmental outcomes.
- Locate and design **plantations**, where possible, to meet desirable environmental outcomes including **water quality** maintenance and landscape protection.
- Ensure that State and local government planning requirements and associated legislation, and any specific requirements of land owners/land managers/**plantation** owners for **plantation establishment** are satisfied.

Guidelines

Plantation establishment can only be considered for cleared agricultural land or land previously growing a **plantation**. Clearing of **native vegetation** for plantation establishment is contrary to the policy of the Western Australian government. The location of plantations must consider the following constraints:

- A thorough investigation of site attributes must be undertaken to ensure that the desired returns for the species and products being proposed will be realised (see *Section 4.6*). This may include computer generated stand growth and financial models.
- An assessment of infrastructure and logistical requirements to service the enterprise should be undertaken, including an accessible workforce for the supply of silvicultural services.
- Sites of cultural significance – in accordance with the latest relevant legislation as per *Section 3: 4a, 4b, 4c and 4d*.
- The presence of priority and threatened flora and fauna species together with priority and threatened ecological communities – in accordance with the latest relevant legislation as per *Section 3:5d and 5i*.
- The proximity to airports or airstrips – in accordance with the latest relevant legislation as per *Section 3:1a*.
- State and local government planning requirements – in accordance with the latest relevant legislation as per *Section 3:9e and 9f*.

Once the constraints of a **plantation** location have been determined and considered, the plantation design must consider the following aspects:

- **Plantations** must be designed in accordance with the latest relevant legislation as per *Section 3:6a, 6b and 6c*.

- **Plantations** must be designed in accordance with the road design principles (see *Section 4.5*).
- **Water quality** should be protected by careful planning and control of the location and timing of machine operations during **site preparation** and harvesting. This should be done with the aim of not permitting disturbance of the **watercourse** or **wetland** and minimising the chance of soil or chemicals being transported to the watercourse or wetland. Non planted **buffers** of at least six meters should be maintained from the edge of a watercourse.
- **Plantations** should not be established on slopes in excess of one in three. Slope limits of one in seven should be applied in areas where the **erosion hazard** is high. Where existing plantations occur on steep slopes, they may be harvested and replanted, provided that soil stability is not compromised. Note: the **establishment** of plantations may be considered on steep slopes that are already cleared and subject to erosion since this may actually improve soil stability.
- The taking or diversion of surface water and abstraction of groundwater for commercial irrigation purposes from areas that are proclaimed in accordance with the latest relevant legislation as per *Section 3: 17e* is subject to licensing by the DoW.
- Existing **native vegetation** adjacent to **watercourses**, **wetlands** and **reservoirs** should be protected from degradation.

4.4 Plantations within Public-drinking-water Source Areas

Goals

- No detrimental impact on **raw water** quality because of activities in **plantations** situated in **PDWSAs**.
- **Water quality values** to be protected within water resources including groundwater, **watercourses**, springs, **wetlands** and **reservoirs**. The key water quality issues relevant to **plantation management activities** are pathogens, turbidity and erosion, nutrient **run-off** from fertilisers and chemical spills.

Guidelines

- The quality of public drinking water sources is protected by proclaiming underground **water pollution** control areas, **catchment** areas or water reserves in accordance with the latest relevant legislation as per *Section 3:17b*.
- The regulations in accordance with the latest relevant legislation as per *Section 3:5c* and by-laws under the *MWSS&D* and the *CAWS Acts* enable the DoW to control potentially polluting activities, to regulate land use, inspect premises and to take steps to prevent or clean up pollution in **PDWSAs**.

- To protect the quality of **PDWSAs**, the DoW has defined three levels of priority classification in the water-quality protection note 'Land Use Compatibility in Public Drinking Water Source Areas'. This note provides information on land use and activities that may affect the quality of the State's water resources.
- The DoW recognises that many **plantations** were established in **PDWSAs** before the current strategy to protect water resources was implemented. The **plantation manager** will negotiate with the Department (on a case-by-case basis and including on-site inspections as necessary) to develop appropriate management practices to minimise the impact on water resources, while taking into consideration the primary commercial objectives of the plantations.
- In **PDWSAs**, the preparation of **management plans** for new or replacement **plantations** should be developed in consultation with the DoW or its delegated representative to set out measures for protecting **water quality values** as well as ensuring commercial viability.
- In **PDWSAs**, **vegetated** (e.g. pasture) **buffer** zones adjacent to **watercourses** and **reservoirs** are necessary to maintain water quality. Refer to the DoW's water quality protection note: *Vegetation Buffers to Sensitive Environments*.
- The application of chemicals, including fertiliser and **pesticides**, in **PDWSAs** must be in accordance with DoH, DoW, and Environmental Protection Authority (EPA) policies and guidelines. The interpretation of policies and guidelines should be achieved by consultation between the relevant government agency and the **plantation manager**.
- If a **plantation** within a **PDWSA** is to be harvested and not re-established, a plan addressing subsequent land use activities (where the development of such activities is the responsibility of the plantation grower) should be developed in consultation with the DoW. Whilst **reversion** to the pre-plantation land use is acceptable, any changes to the use of the land before the **establishment** of the plantation should be compatible with water source objectives for that **catchment**.
- Harvesting of **plantations** established for commercial reasons on land that was previously cleared pasture will not be restricted, either within or outside the influence of a **PDWSA**, provided that adequate measures to protect water quality are incorporated in the **plantation harvest plan** and on-ground operations. **Thinning** to protect the water yield may be a part of the **plantation management plan** for plantations within a **PDWSA**.

4.5 Roads

4.5.1 Plantation Roads

4.5.1.1 General

Goal

Ensure that access within **plantations** is of an adequate standard to ensure that **plantation establishment, tending**, fire management and harvesting can be carried out efficiently and safely, without adverse offsite impacts.

Guidelines

- Roads and **tracks** of a suitable standard should be established before they are required to be used, to allow consolidation of the running surface.
- **Temporary roads** established for a specific operation should be closed and rehabilitated unless they serve an ongoing purpose.
- All roads should be adequately drained and stabilised to improve pavement strength, consistent with the intended use.
- Roads should be located on alignments and grades that provide the required standard of access without compromising road safety, **water quality** and other environmental values.
- New roads should be kept to the minimum necessary to satisfy management requirements, be located in an appropriate position (e.g. avoiding **watercourse** crossings where possible), and be constructed under suitable weather conditions with an appropriate lead time to allow consolidation.
- New roads specific to the harvesting operation should be outlined in the **plantation harvest plan**.

For additional information on environmental measures, see the DoW's Water quality protection note: *Roads near Sensitive Water Resources*.

4.5.1.2 Road Location

Goal

Locate roads to provide adequate and safe access within the **plantation** whilst minimising the risk of soil erosion and the degradation of **water quality**.

Guidelines

Roads should be planned, where possible, such that they:

- are constructed on the contour to minimise the need for drainage works;
- require the minimum amount of **vegetation** clearing necessary for road construction, safe operation and maintenance;
- minimise the spread of diseases, pathogens and declared weeds;

- minimise the number of **watercourse** crossings and other interference with natural drainage;
- are located outside the **riparian zones** of **watercourses** and **wetlands**, except for waterway crossings; and
- minimise the amount of earthworks by running along ridges and spurs, and avoiding steep side slopes and areas prone to slippage.

4.5.1.3 Road Design

Goal

Roads are designed to carry the level of traffic anticipated in **plantations** throughout the **rotation**, and beyond if necessary, with reasonable safety.

Guidelines

- New or upgraded roads should be designed to accommodate the anticipated frequency, type and speed of traffic, soil and sub grade conditions, road drainage and **water quality** requirements, and landscape and other environmental values.
- **Permanent roads** should be constructed on alignments with ruling grades that generally do not exceed one in 10, steeper grades being permissible for short sections with appropriate drainage controls to minimise erosion. **Temporary roads** may be constructed on alignments with ruling grades steeper than one in 10, provided erosion controls are implemented.

4.5.1.4 Road Construction

Goal

Plan and construct roads well in advance of harvesting operations and to coincide with favourable weather conditions.

Guidelines

- Road construction should be undertaken when soil is not saturated in order to minimise the risk of erosion. Sufficient moisture needs to be present or added to enable stabilisation of the road surface and road sub grade.
- **Hygiene** practices should be implemented where necessary to prevent the spread of soil-borne pathogens and declared weeds. Information is available from the DPaW.
- Stumps and other debris should not be buried in the load-bearing portion of the road.
- Embankments and fills should be stabilised using accepted engineering practices.
- When constructing **permanent roads**, topsoil should be stockpiled and returned to **batters** and embankments ready for **rehabilitation** works.

- Drainage structures should be installed concurrently with the formation of the road. Sections of partly constructed road to be left over winter or for other extended periods should be drained by out-sloping or cross-drains.
- To avoid spills of fuel and oil reaching **watercourses, wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.

4.5.1.5 Road Drainage

Goal

Road drainage should prevent erosion as far as possible and not have a detrimental impact on **water quality**.

Guidelines

- Roads should be constructed to facilitate and control **run-off**.
- Drainage structures should be spaced according to the road grade, soil type, and conform to accepted standards.
- Drainage from roads should discharge onto rocked spillways or into the **plantation** or undisturbed **vegetation**. Direct discharge of water containing soil matter into **watercourses, wetlands** or **reservoirs** should be avoided.
- All culverts, drains and silt traps should be kept clear of soil and debris likely to obstruct the flow of water and, as a minimum; they should be cleaned out before the wet season and following significant storm events.
- Discharge points from roads should be provided before the road enters **riparian zones** or **buffer** strips.

4.5.1.6 Road Batters

Goal

Maintain the integrity of roads by appropriate design and maintenance of **batters**.

Guidelines

- **Batters** should be sloped and stepped if necessary to avoid riling and slumps.
- Topsoil should be returned to **batter** surfaces and revegetated.
- Catch drains above battered banks exceeding three metres in height should be installed to reduce erosion of the **batter**.
- Retaining walls and other structures should be used where necessary to maintain the integrity of the **batter**.

4.5.1.7 Watercourse and Drainage line Crossings

Goal

Minimise the number of **watercourse** crossings. Where it is necessary for a road to cross a watercourse, it should be via a bridge, culvert or ford. Design of such should meet the transport needs and minimise impacts on **water quality** and **riparian vegetation**.

Guidelines

Crossings should account for the volume of the average flow, particularly taking into consideration the impact of clear felling and **site preparation** practices on **run-off** into drainage channels.

Construction should ensure that:

- Disturbance to the **watercourse** bed and banks is minimised.
- Fill or spoil material is not pushed into **watercourse**, nor into a position where it can move into a watercourse.
- Cement and raw concrete are not spilt into running **watercourses** as they can be toxic to aquatic fauna and flora.
- Bridges should be designed to prevent overtopping during one in 10-year flood events and be protected by debris traps in areas of regular flooding.
- Fords may be constructed on roads where use is infrequent or water flow is light.
- Permanent culverts should be designed to cope with peak flows (e.g. a one in 10-year flood event). Water that is diverted by a culvert must be returned to its natural course by a **flume**, rocked spillway or other hard-surfaced construction to minimise erosion. Culverts should be aligned across **watercourses** such that the construction does not prevent the movement of aquatic fauna up-stream.
- Excavations for bridges, placement of sills or abutments should not alter natural **watercourse** flow, and the positioning of **stringers or girders** should be above the high water mark. Earth embankments constructed for bridge approaches should be protected from erosion by revegetation, retaining walls, bulkheads or rock surfaces. Topsoil should be stockpiled for re-distribution to assist **rehabilitation**.
- Temporary bridges and culverts should be removed promptly after use and the approaches rehabilitated.
- A permit is required to interfere with the bed and banks of **watercourses** proclaimed in accordance with the latest relevant legislation as per *Section 3:17e*. Contact DoW regional offices for information on proclaimed areas and permit applications.

4.5.1.8 Road Maintenance

Goal

Maintain road surfaces and drainage installations in order to protect the road foundation and form, and to provide for continuous safe drainage.

Guidelines

- Roads should be maintained to provide for the safe operation of vehicles; ensure the integrity of the surface remains intact to ensure that drainage is not impeded; and to ensure that systems are not allowed to deteriorate such that erosion may occur.
- **Vegetation** on the verges of roads should be managed to maintain visibility and to prevent drainage systems becoming blocked.
- The condition of the roads and associated drainage should be regularly assessed.
- Drainage structures should be maintained regularly.
- Road maintenance programs should be undertaken at least annually, including inspection of culverts and silt traps. If necessary, they should be de-silted prior to commencement of the wet season.

4.5.1.9 Road Closures

Goal

Effective measures are in place to facilitate prompt closure of unpaved roads when damage conditions occur or when they are no longer required for management purposes.

Guidelines

- Roads should be closed to heavy traffic and be rebuilt if structural damage to the road occurs.
- Roads that are to be permanently closed should be ripped then rehabilitated either by planting with a commercial species or appropriate alternative **vegetation**.
- Roads should be closed to heavy and light traffic, or suitably upgraded, when **water quality values** are threatened in neighbouring **watercourses**. Measures should be taken to minimise adverse impacts on water quality.

4.5.2 Public Roads

The **road manager** for **public roads** is in many cases the local authority and for major routes, MRWA may be the manager. Roads through DPaW managed land may be the responsibility of the local authority and others may be managed by DPaW.

Goal

Maintain the integrity of the **public road** system used for the haulage of wood products whilst ensuring public safety.

Guidelines

- Where local roads have been designated by the relevant **road manager** to be below the standard appropriate for the haulage vehicle being used, traffic management measures are to be implemented following consultation with the local government to minimise damage to the road and to ensure safety requirements are met. For details refer to Appendix 2.
- **Plantation managers** must be aware that **road managers** may require some modification or restrictions to the proposed haul route to ensure the safety of other road users.
- Where more than one **plantation manager** proposes to use a particular road as a haulage route at the same time, the owners in consultation with the **road manager** should coordinate activities to minimise damage to the road network and to ensure a safe work environment is achieved.
- **Plantation managers** should (where practical) join regional road advisory committees to assist in road-traffic planning processes and to coordinate regional road issues, including contributing information and advice to State and Federal Government processes in relation to funding for road upgrades and maintenance, and to coordinate harvesting and road haulage activities.
- The **plantation manager** must ensure that roads used as haulage routes are reinstated following harvest to at least the condition existing before harvesting. A pre-harvest joint inspection of the condition of the roads should be conducted between the grower and the responsible **road manager**.
- Following the completion of harvest a further joint inspection of the relevant local roads, used as a haulage route should be conducted by the same parties.
- The **plantation manager** is only responsible for reinstatement and/or repairs in respect to any damage, excluding fair wear and tear, caused to roads that are directly related to the haulage of harvested wood products from land on which the harvest has taken place.

4.5.2.1 Pits Supplying Materials for Road, Bridge or Log-landing Construction

Goal

Locate gravel pits, **borrow pits** and disposal pits to minimise the impact on water quality, and not affect other environmental values.

Guidelines

- Where the development of gravel pit or **borrow pit** involves the **clearing of native vegetation**, a clearing permit in accordance with the latest relevant legislation as per *Section 3:5c* is required, unless an exemption applies. Preference should be given to establishing quarries, gravel pits or borrow pits on cleared or highly degraded land.
- **Hygiene** practices must be implemented to prevent the spread of soil-borne pathogens and weeds. For more information, contact DPaW.
- **Borrow pits** located in **PDWSAs** must be managed in accordance with the DoW's Water quality protection note: *Extractive Industries near Sensitive Water Resources*.
- Gravel pits and **borrow pits** should be located at a suitable distance from **watercourses** and **riparian zones** (preferably at mid- or upper-slope) so as not to damage the watercourse and riparian values.
- **Run-off** from disturbed surfaces (e.g. gravel pits and quarries) should, where possible, be directed into areas of undisturbed **vegetation** and not allowed to run into **wetlands**, **watercourses** or drainage channels unless soil matter has settled out (i.e. discharged into silt traps or sumps).
- Gravel pits and **borrow pits** should be rehabilitated within one year of the pit becoming redundant or exhausted. Banks should be **battered**, compacted areas ripped and topsoil returned.
- **Plantation management plans** should take into account gravel resources on a property to allow for gravel reserves be accessible for future road requirements.

4.6 Silviculture of Plantations

4.6.1 Site Assessment

Goal

Assess potential sites for **plantation establishment** in accordance with accepted site-selection methods to ensure that limitations to growth are identified.

Using the assessment system to identify sites that require modification (i.e. ripping, mounding and draining) to ensure acceptable **establishment** and growth, whilst considering wind and water **erosion hazards**.

Guidelines

- All land proposed for **plantation** development should be subjected to site assessment to determine suitability.
- **Plantation** sites should have soils of adequate depth and rainfall sufficient to sustain a plantation for the **rotation**.
- Site surveys should be carried out with trained staff using accepted standards.
- All soils should be assessed for salinity and pH using an electrical conductivity meter or by soil-sampling techniques and managed accordingly. The risk to **plantation** growth and survival posed by rising saline groundwater should be considered.

4.6.2 Species Selection

Goal

Establish **plantations** with species or hybrids selected for their rate of growth, quality of wood or other products with suitability to the site.

Guidelines

- At the discretion of the **plantation manager**, **plantations** should be established with species selected for their market, type of wood or other products, adaptability to particular sites, productivity, form and resistance to **pests** and **diseases**.
- **Plantation** species will commonly be **exotic** to the locality and need not be native.
- **Plantations** should be managed primarily to yield economic volumes of wood or other merchantable products; however, plantations could be established for other than commercial reasons.

4.6.3 Site Preparation

Goal

Use appropriate **site preparation** procedures to achieve desired **establishment** standards whilst taking due consideration for protection of soil and water qualities.

Guidelines

- **Site preparation** activities must adhere to the requirements of the relevant legislation in accordance with *Section 3: Environment*. Burning of debris during initial clean-up should be carried out in accordance with local government fire-control by-laws and firebreak notices.
- Operation of **site preparation** equipment should avoid **riparian zones**.
- **Site preparation** could include ripping, cultivating and mounding as required to improve **establishment** and achieve stocking levels and growth rates that are acceptable to the **plantation manager**.

- Grade banks should be considered and constructed at appropriate intervals to transfer excess surface water from the site into areas of undisturbed **vegetation**, **filter strips** or back into the **plantation** as appropriate.
- On steep slopes (i.e. greater than one-in-three), broad-scale cultivation should be avoided.
- For subsequent **rotation establishment**, the **plantation manager** may wish to retain **harvest residue** on the site after harvesting to conserve nutrients, assist with soil water retention, reduce weed competition, reduce evaporation loss and reduce erosion risk.
- Where burning of **harvest residue** is the chosen option, burning should be implemented to minimise erosion risk, avoid damage to **vegetation** outside the operational area (e.g. **riparian zones**) and conducted in accordance with fire-prevention requirements and local government fire control by-laws.
- To avoid spills of fuel and oil reaching **watercourses**, **wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.
- **Hygiene** measures should be employed, where appropriate, to reduce the spread of **pests**, **diseases** and weeds to the standards consistent with best practice.

4.6.4 Fertilising

Goal

Apply nutrients and trace elements to correct deficiencies and to stimulate growth to ensure **plantation** productivity and economic viability are maintained. The use of fertilisers should avoid adverse offsite impacts.

Guidelines

- The use of fertilisers in **PDWSAs** must be in accordance with the DoW and Environmental Protection Authority (EPA) policies and guidelines, in accordance with the latest relevant legislation as per *Section 3:17a*, and related environmental protection policies for water source **catchments**.
- Plantations should be monitored for nutrient and trace-element deficiencies and fertilisers applied as found necessary by the **plantation manager**.
- Treated municipal wastewater should only be applied to **plantations** where the soils and substrates have been demonstrated to be suitable for such disposal, and where approval from the Health Department and the DER has been granted, as applicable.
- Fertilisers, particularly nitrogen, are best applied when soils are moist rather than saturated or dry.
- Methods to minimise nutrient transport off site should be applied.
- **Plantation** growers should collaborate to develop best management practice for plantation nutrient management.

4.6.5 Weed Control

Goals

- Control competing **vegetation** in **plantations** at the **establishment** phase to ensure good initial survival of trees and at later stages to promote efficient and economic growth as well as unimpeded access in plantations.
- Use **pesticides** to control weeds within approved labels and/or off-label permits and accepted guidelines for the chemicals being used.
- Use **pesticides** to control weeds and avoid adverse offsite impacts.
- Ensure that any **plantation** species that have the potential to become weeds are prevented from spreading outside the plantation.

Guidelines

- **Pesticides** used to control weeds must be used in accord with labels and off-label permits and the DoH guidelines on the use of chemicals in rural areas contained within the latest relevant legislation as per *Section 3:12e and 12f*.
- **Plantation** growers should also abide by the provisions of the Code of Practice for the Use of Agricultural and Veterinary Chemicals in Western Australia.
- The application of **pesticides** in **PDWSAs** must conform to the DoH's Public Service Circular 88 (*Use of Herbicides in Water Catchment Areas*) and the DER and EPA's relevant statutory regulations.
- Aerial application of **pesticides** must adhere to the provisions in accordance with the latest relevant legislation as per *Section 3:12a*.
- Rates and methods of application must be in accordance with approved procedures as described in the Australian Materials Safety Data Sheets and **specifications** as on the product label.
- Particular care should be taken to prevent **pesticides** being washed or leached into **watercourses, wetlands** or **reservoirs**.
- Unwanted **vegetation**, including **declared plants** and other **prescribed pest plants**, and **plantation** species invading other areas, should be controlled by methods that minimise adverse offsite impacts.
- Disposal of all chemical containers must be as specified by the chemical manufacturer and comply with the latest relevant legislation as per *Section 3:12f*. Empty chemical drums will be disposed of at a Drum Muster location. These are located in most local government waste disposals sites. Drums need to be triple rinsed and drained before taking to the local waste disposal site.
- Only **pesticides** that are registered for use in **plantations** or have been permitted for use by the National Registration Authority under the national 'off label' permit scheme can be used.
- Plantation managers **will endeavour to cooperate with neighbours and public authorities to control the spread of wildlings into adjoining lands**.

- Weeds should be controlled using appropriate methods at the time of **establishment** or at any other time during the life of the **plantation** as deemed appropriate by the **plantation manager**.
- **Exotic** trees or plants should not be allowed to spread into neighbouring native forest or woodland from **plantations**. If this occurs, practical measures should be taken, to remove such plants or trees. Where plantation trees or plants have established on neighbouring properties the owner should be consulted before their removal.
- Persons applying **pesticides** may require licensing with the DoH subject to the provisions of regulations listed in *Section 3:12(f)*.

4.6.6 Control of Insects

Goals

- Minimise the impact of **pest** damage to **plantations** by the use of **pesticide** sprays and biological or physical control techniques to ensure that plantations are not adversely affected and remain commercially viable.
- Use **pesticides** within accepted guidelines for the chemical being used.
- Use of **pesticides** should avoid adverse offsite impacts.
- Use **pesticides** with due consideration for neighbouring activities that may be sensitive to **pesticides**.

Guidelines

- Aerial application of **pesticides** must adhere to the provisions of the latest relevant legislation as per *Section 3:12a*.
- The application of **pesticides** in **PDWSAs** must be in accordance with the DoH, DoW, DER and EPA. This includes the DoW's statewide policy *Pesticide Use in Public Drinking Water Source Areas*.
- Chemicals used to control insect **pests** must be used in accordance with the Public Health Guidelines on the use of chemicals in rural areas contained in accordance with the latest relevant legislation as per *Section 3:12e*.
- **Plantation** growers must abide by the provisions of the 'Code of practice for the use of agricultural and veterinary chemicals in Western Australia'.
- Where **pesticides** are used they must be registered by the National Registration Authority or used under permit according to the national 'off label' permit scheme.
- Rates and methods of application of **pesticides** must be in accordance with approved industry **specifications** and the product label specification.
- **Plantations** should be monitored regularly for insect **pests**, particularly at times when insect pests are known to be active.
- The **plantation manager** should, where practicable, implement control measures when threshold levels are reached and or when the level of damage is considered to be unacceptable.

- Aerial spraying activities are to be managed according to an aerial spray application management plan (Appendix 3) which outlines a process of communication between **plantation managers** and **neighbours**, to ensure that neighbours: (1) are aware of planned spray activities; (2) have the opportunity to comment on the development of a spray plan; and (3) take any precautionary measures they choose.
- **Pesticides** should not be applied by air unless all adjacent landholders have been notified.
- Particular care should be taken to avoid **pesticides** being washed or leached into water bodies.
- **Integrated pest management** systems should be considered to help reduce insect populations and to complement other insect control techniques.
- Measures to prevent the introduction of **exotic** insects should be addressed by the implementation of a management plan developed by the **plantation manager**. Early warning systems to identify outbreaks of exotic insects should be implemented, and control systems for immediate deployment should be in place.
- The **plantation** industry through the Plantation Industry Biosecurity Group should undertake pest risk assessments for potential harmful **exotic** organisms and develop risk management plans to mitigate against the introduction of exotic organisms.
- Disposal of all chemical containers should be as specified by the chemical manufacturer and in accordance with the latest relevant legislation as per *Section 3:12f*. Empty chemical drums will be disposed of at a Drum Muster location. These are located in most local government waste disposals sites. Drums need to be triple rinsed and drained before taking to the local waste disposal site.
- Persons applying **pesticides** may require licensing with the DoH subject to the provisions of regulations listed in *Section 3:12(f)*.
- **Plantation** growers should collaborate to develop best management practice for the assessment and management of plantation **pests**.

4.6.7 Control of Vertebrate Pests

Goal

Control vertebrate **pests** in **plantations** using accepted methods.

Guidelines

- Control of animals (native and feral) must adhere to the latest relevant legislation in accordance with *Section 3:2b* and the *Wildlife Conservation Act 1950 Section 3:5j*. Native vertebrates that impinge on the productivity of **plantations** should be controlled under damage permits issued (if required) by DPaW using methods stipulated on the permit.
- The application of **pesticides** in **PDWSAs** must be in accordance with the DoH, DER, and EPA relevant statutory regulations.

- Damage to **plantations** or seed orchards by birds may be addressed by the use of deterrents or a combination of control strategies. Where control of protected native species becomes necessary, permits must be obtained from the DPaW.
- **Pests** should be controlled before the **establishment** of **plantations** and in existing plantations, if the **plantation manager** considers control necessary.

4.6.8 Disease Control and General Plantation Health

Goal

Manage **diseases** in **plantations** to maintain the plantations in good health.

Guidelines

- Health and vigour should be monitored and promoted through appropriate management practices to reduce **disease** impacts in the **plantation** estate.
- **Plantations** should be monitored periodically for outbreaks of pathogens and remedial action taken where feasible.
- Special measures may need to be implemented at a regional scale to manage future threats to the health and productivity of **plantations** and surrounding lands. Where practicable, this should be achieved through cooperation and collaboration, within the industry, with **neighbours** and in accordance with the requirements of *Section 3:2b*.
- It is preferable that nursery stock should be grown in nurseries accredited under the Nursery Industry Association of Australia scheme.
- Contemporary **hygiene** techniques should be implemented, where appropriate, to stop the spread of any declared or **exotic pest, disease** or weed within a **plantation**.
- If the introduction of an **exotic pest, disease** or weed is suspected that triggers **incursion response**, the relevant authority must be notified.

4.6.9 Thinning and Pruning

Goal

Manage **plantations** to achieve specific objectives by the use of appropriate silvicultural strategies.

Guidelines

- **Plantations** should be thinned, where required, to maintain stand health and to increase yields of high-value products where this is an objective of the manager and is considered to be economically desirable.
- **Plantations** may be pruned to meet specified wood production objectives or for access, fire control and visibility.

It is recommended that records of pruning and **thinning** operations be maintained.

4.6.10 Coppice Management

Goal

Coppice management is often used in hardwood **plantations**, subsequent **rotation** where the **plantation manager** has elected to grow the subsequent rotation from coppice, rather than re-establishing it with tree stocks.

Guidelines

- Prior to **coppice thinning**, a coppice assessment should be undertaken to ensure that there is an adequate strike rate of stumps to allow a **coppice rotation** to be managed.
- **Coppice** is typically thinned at 18 months to three years after harvest
- Thin **coppice** to the desirable number of stems per stump with retained stems selected on dominance, attachment to the stump, vigour and form; and
- Reduce stocking in the stand to the prescribed stocking.

4.7 Timber Harvesting

4.7.1 Planning

Goal

- Provide local governments with information, in advance, relating to the harvest and planned use and management of local roads.
- Minimise adverse impact on the integrity of **public roads** and other road users.
- Harvest **plantations** based on a **plantation harvest plan** (as outlined in Appendix 1B), with the aim of maximising timber recovery without detrimental impacts on the environment.

Guidelines

- Notify local governments of the schedule of harvesting and the intention to use **public roads** at least 18 months before intended harvesting operations if practicable or applicable. The initial advice does not necessarily require the preparation of a detailed **plantation harvest plan** and is primarily for local government planning and budgetary purposes. For details refer to Appendix 2A.
- Where appropriate, the **plantation harvest plan** must comply in accordance with the latest relevant legislation as per *Section 3:11a, 5a, 6a, 5i, 5c, 18c and 17a* as a condition of **establishment** of a **plantation**.
- In circumstances where harvesting is necessary following a natural disaster (wind, fire, drought etc.) the **plantation manager** must make special representation to the local government to facilitate harvesting and transport procedures.
- Where a number of adjoining **plantations** are proposed to be harvested over a one-year period, the **plantation manager** may develop a single **plantation**

harvest plan designed to cover all those plantations instead of developing plans for individual plantations.

4.7.2 Felling Operations

Goal

Felling operations are carried out by competent operators using appropriate equipment to maximise utilisation with due care for safety and the environment.

Guidelines

- Felling should be carried out in accordance with the **plantation harvest plan**.
- As a general principle, trees should not be felled across wetlands, **watercourses**, **riparian zones** and natural **drainage lines**. All tops, and other debris generated by the felling operation should be cleared from culverts, road drains, sumps, roads, and firebreaks.
- To avoid spills of fuel and oil reaching **watercourses**, **wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.
- **Hygiene** measures should be employed, where appropriate, to reduce the spread of **pests**, **diseases** and weeds to the standards consistent with best practice.

4.7.3 Processing and Extraction

Goal

Process and extract timber from **plantations** by deploying experienced and adequately trained operators using appropriate equipment suited to the plantation conditions so as to achieve acceptable standards of utilisation, safety, environmental care and economic efficiency.

Guidelines

- Special attention should be given to the location of entry points from the **plantation** onto **public roads** for reasons of safety and road maintenance.
- Harvesting machinery should not enter **riparian zones** or designated **buffers**.
- Harvesting residue should not be placed in wetlands, **watercourses**, **buffers** and **drainage lines** in the course of harvesting operations. Any debris blocking more than 10 per cent of the cross-sectional area of a drainage line or watercourse should be removed, as it may affect water levels and contribute to erosion or flooding.
- All culverts and road drains should be kept clear of soil or logging debris that may prevent the flow of water.

- **Hygiene** measures should be employed, where appropriate, to reduce the spread of **pests, diseases** and weeds to the standards consistent with best practice.
- Procedures should be incorporated into the Timber Harvest Plan to address situations where unacceptable **soil damage** or erosion is likely.
- To avoid spills of fuel and oil reaching **watercourses, wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.

4.7.4 Log Landings and Processing Sites

Goal

Log landings and forestry product processing sites are located, constructed, maintained and rehabilitated with regard to the efficiency of the operations and the principles of environmental care outlined in *Section 2.1.1*.

Guidelines

- Log landings and processing sites should be located within the **plantation** where possible but should not be located within retained **native vegetation** (areas retained through plantation planning and design – refer to *Section 4.3*).
- Log landings and processing sites should not be located on areas that are likely to impact on the integrity of **watercourses, wetlands** and **drainage lines**.
- Log landings and processing sites should be located away from dwellings.
- Non-permanent log landings and processing sites should be rehabilitated such that they can be re-established to **plantation**.
- In **PDWSAs**, the end land use for non-permanent log landings and processing sites should be consistent with the protection planning for the water source.
- Drainage-control measures should be employed where necessary to protect water bodies.
- To avoid spills of fuel and oil reaching **watercourses, wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.

4.7.5 Haulage

Goal

Haul timber from **plantations** using experienced and adequately trained operators utilising appropriate equipment to achieve acceptable standards of safety, environmental care and economic efficiency.

Guidelines

- Comply with the latest relevant legislation as per *Section 3:7b*.

4.8 Reversion

Goal

Plantations may be changed back to an alternative land use. The goal is to revert plantations, using experienced and adequately trained operators utilising appropriate equipment, to achieve acceptable standards of safety, environmental care and economic efficiency.

Guidelines

- Where the **plantation** will not be re-established, a plan addressing subsequent land use should be developed where required, in consultation with relevant agencies and the landowner/manager.
- **Reversion** activities must adhere to the requirements of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and the *Soil and Land Conservation Act 1945* in accordance with the latest relevant legislation as per *Section 3:5f and 5i*.
- To avoid spills of fuel and oil reaching **watercourses**, **wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.
- **Hygiene** measures should be employed, where appropriate, to reduce the spread of **pests**, **diseases** and weeds to the standards consistent with best practice.
- **Reversion** machinery should not enter **riparian zones** or designated **buffers**.
- Only **pesticides** that are registered for the relevant land use by the National Registration Authority under the national 'off label' permit scheme should be used.
- Burning of debris during clean-up should be carried out in accordance with local government fire-control by-laws and firebreak notices.
- **Run-off** from disturbed surfaces should, where possible, be directed into areas of undisturbed **vegetation** and not allowed to run into **wetlands**, **watercourses** or drainage channels unless soil matter has settled out (i.e. discharged into silt traps or sumps).

4.9 Storage and Handling of Chemicals, Fuels and Oils

Goal

Implement appropriate measures to ensure health, safety or environmental **incidents** involving the storage, transport, handling and disposal of chemicals, fuels and oils are prevented/minimised.

Guidelines

- In accordance with documents listed under the **pesticides/spraying, hazardous substances/ dangerous goods** and OSH categories of *Section 3*, chemicals must be stored, used and disposed of according to product registration and label specifications; appropriate off-label permits as provided by the Australian **Pesticides** and Veterinary Medicines Authority (APVMA), and the provisions of relevant legislation and other requirements.
- Ensure any chemical product restrictions and protocols that apply for ‘water protection areas’ as proclaimed in documents listed under the Water category of *Section 3* are adhered to.
- The discharge of hydraulic fluids, engine oil or fuel onto the ground should be avoided. If an accident occurs, clean-up systems should be applied immediately. Chemical drums should be located where there is no possibility of contaminating waterways. Waste oil, empty drums, discarded machinery parts and other waste should be immediately removed from the **plantation** at the completion of servicing.
- To avoid spills of fuel and oil reaching **watercourses, wetlands** and **reservoirs**, refuelling of machinery should be undertaken away from these areas.
- Persons applying **pesticides** may require licensing with the DoH subject to the provisions of regulations listed in *Section 3:12(f)*.

4.10 Incident Management

Goal

Develop and implement appropriate **incident** management procedures to address the human health, environmental, and economic effects of incidents associated with **plantation** activities.

Guidelines

As part of the **plantation** grower’s duty of care to maintain safe and health workplaces and systems of work, investigate accidents and **incidents** to prevent reoccurrence.

Report any noticeable **incidents** suffered by an employee to the Worksafe WA Commissioner. A list of these injuries and diseases can be found in OSH Regulations 2.4 and 2.5.

In accordance with *Section 3*, report any discharge of waste that has caused or is likely to cause pollution, material environmental harm as defined in the Act or serious environmental harm to the DoE regulation.

Plantation growers should prepare and maintain:

- an effective **incident management plan** to respond to incidents likely to impact on the local environment. This may be a generic plan that can be activated in the event of any type of incident; and

- procedures to effectively minimise the detrimental impacts of **incidents** that may have a localised affect on human health, environment, or the economy.
- Designated **plantation** staff and contractors should be trained and equipped to effectively deal with foreseeable **incidents**, for example spills and events involving powerlines.
- Any spill of **pesticide**, fuel or other chemical to the environment in a **PDWSA** should be reported on discovery to the Water Corporation.
- Procedures that define the action to be taken in the event of an **incident** should also specify remedial action and **rehabilitation** procedures after the event.

4.11 Agriculture Protection and Neighbour Relations

Goal

Foster good relations between **plantation managers**, local government and neighbouring landowners.

Prevent unauthorised or **disease**-carrying domestic stock from residing in **plantations** and ensure measures are in place to prevent plantations becoming a refuge for feral animals.

Manage **declared plants** and other **prescribed pest plants** and **pest** weeds in **plantations** appropriately.

Guidelines

- Owners of **plantation** land must maintain boundary fences in accordance with the latest relevant legislation as per *Section 3: 10a*.
- **Plantation managers** must act in accordance with the latest relevant legislation as per *Section 3:2c* in relation to potential **disease** outbreaks on their property.
- **Declared pests** and weeds present in **plantation** areas must be managed in accordance with the latest relevant legislation as per *Section 3:2b*.
- Importation into Western Australia of plant material or timber products must be undertaken in accordance with the latest relevant legislation as per *Section 3:2e, 2f*.
- **Plantation managers** should endeavour to notify neighbouring landowners prior to the commencement of potentially disruptive activities including shooting and burning (including outside of restricted burning times).
- Any unauthorised stock in **plantations** may be removed in accordance with the latest relevant legislation as per *Section 3:14a*. Reasonable efforts should be made to identify owner prior to removal.

4.12 Research and Development

Goal

Maintain an adequate research capacity to improve economic efficiency of **plantations**, develop new technologies and to ensure that plantation objectives are met.

Guidelines

- **Plantation managers** (where practical) should maintain a research capacity or support external research agencies and local research cooperatives.

4.13 Safety

Goal

Carry out **plantation** operations as safely as practical and in accordance with all relevant occupational safety and health legislation, codes of practice and standards.

Guidelines

- **Plantation establishment**, management, harvesting and fire protection activities must comply in accordance with the latest relevant legislation as per *Section 3:10a and 11a*.
- All operators must wear specified, personal safety equipment for the operation.
- Operators should be trained and certified to accepted standards in the safe use of equipment, materials and machinery.
- Managers, contractors and workers should be jointly responsible for determining and implementing safe work practices.

4.14 Competency and Training

Goal

Employ competent personnel to operate in **plantations** and carry out the duties prescribed in accordance with best practice for **plantation management**.

Guidelines

- Training of personnel engaged in **plantation** activities is the collective responsibility of **plantation managers**, contractors and subcontractors.
- **Plantation managers**, employees and contractors should be appropriately trained, licensed or deemed competent.
- Training should be based on the provisions of **competency**-based training in accordance with the latest relevant legislation as per *Section 3:15a* to ensure recognition for practitioners against the Australian Qualifications Framework.

- Personnel required to operate in **plantations** located in **PDWSAs** should be aware of requirements for management of these areas.

Section 5: Fire Prevention and Suppression

5.1 Fire Prevention

Goal

Prevent bushfires entering or escaping from **plantations** consistent with State and local government requirements.

Guidelines

- The size of **plantation** compartments and firebreak specifications must comply with the latest relevant legislation as per *Section 3: 6a and 6b* issued by the DFES and local government firebreak notices.
- Vehicles and machinery travelling in **plantations** during restricted and prohibited burning times must comply with the latest relevant legislation as per *Section 3:6a and Australian Standard 1687*.
- **Plantation** owners and landowners may require specific limitations on plantation **tending** and/or harvesting activities to address particular issues regarding fire prevention. This should be incorporated into the **Fire Management Plan** and complied with by the **plantation manager**.
- A **fire management plan** should be available for each **plantation**. (Refer to Appendix 1.)
- Firebreaks, water points and **plantation** compartments should be shown on the **plantation map**.
- Firebreaks, roads and **tracks** should be maintained free of flammable material during the bushfire risk period. Measures to minimise erosion and preserve water quality are maintained.
- Roads and internal breaks within **plantations** should be maintained in a trafficable condition and must allow through traffic.
- Prescribed burning should be considered at a regular interval in **native vegetation** and paddocks adjacent to **plantations** to reduce fuel loads as a means of protecting the plantation and the native vegetation from wildfire. **Plantation managers** should cooperate with local government, relevant landowners and authorities in burning for fuel reduction.
- Grazing should be considered, where appropriate, to reduce fuel loads in **plantations**. Grazing in **PDWSAs** should be consistent with **water quality** protection objectives and should be treated in accordance with normal grazing practices
- **Plantations** should be pruned as required in strategic locations for fire protection and to allow easy access in the event of a fire in accordance with local government firebreak notices.

5.2 Bushfire Suppression

Goal

Identify and control fires that start in **plantations** or threaten plantations in the shortest time possible.

Guidelines

- Bushfire suppression activities must adhere to all relevant legislation in accordance with the latest relevant legislation as per *Section 3:6*.
- The use of fire retardants in **PDWSAs** must be in accordance with the DoW and EPA regulations.
- Personnel employed in **tending** and harvesting operations should be trained in fire awareness to a level that meets the minimum standards for **plantation managers** OSH and Environment and/or DFES guidelines for **plantation** fire protection.
- **Plantation** owners and managers should engage with local government and state government authorities to assist with bushfire risk management activities.
- This Code promotes coordination and cooperation between **plantation** managers, local government authorities, local volunteer fire brigades, DPaW and DFES in fire prevention, detection and suppression activities.
- **Plantation** owners are required to pay the prescribed emergency services levy to the local government authority annually, in accordance with the relevant legislation as per *Section 3: 6*. A sufficient number of water points must be established and maintained in or nearby to plantations.
- **Plantation** owners and managers should participate in local fire brigades to assist in fire prevention planning and control activities.

Appendix 1: Protocols for Management Plans

A. Plantation Management Plan

A plantation management plan is prepared to provide relevant information in respect of the way in which plantations are developed and managed, and to demonstrate the means by which the principles of environmental care, cultural, heritage social and economical management objectives are achieved.

Plantation management plans are dynamic documents and may change from time to time as a result of new information, new or revised laws, or for strategic or operational imperatives.

Plantation management plans are recommended content; however land managers/owners and/or plantation owners may have other requirements.

A plantation management plan should take account of the scale of operations and may include the following:

1. a plantation map;
2. an establishment plan;
3. a maintenance plan; and
4. a fire management plan.

1. Plantation Map

A map of the plantation should provide the following:

- plantation manager details;
- an area statement showing plantation categories and areas;
- a locality plan and access roads;
- cadastral information;
- known environmental and OSH hazards;
- improvements:
 - buildings;
 - roads, tracks, firebreaks, bridges, creek crossings;
 - fences, gates, utilities, water points;
- natural features:
 - watercourses and wetlands;
 - areas of native vegetation; and
 - significant values.

2. Establishment Plan

This should outline the following topics and how they are to be managed:

- areas of native vegetation and significant values;
- setback distances to watercourses, wetlands, reservoirs and significant values;
- statutory setback distances to dwellings and gazetted infrastructure;
- management of harvest residue;
- control of declared animals, declared plants and other pest plants;
- areas to be planted, compartment sizes;
- species to be planted;
- direction of planting lines in relation to contours and natural drainage;
- description of soil preparation methods;
- pest and weed control prescription;
- planting prescription;
- access and firebreaks
- fertilising prescription;
- sensitive neighbours;
- sensitive property; and
- security management

3. Maintenance Plan

This should outline the following management activities to be conducted during the rotation of the plantation and how they intend to be managed:

- native vegetation management;
- pruning and thinning regimes;
- control of declared animals, declared plants and other pest plants;
- weed and pest control prescription;
- fertilising prescription;
- access and firebreak maintenance;
- grazing strategy;
- inventory;
- bio-security issues;
- infrastructure maintenance; and
- significant feature management.

4. Fire Management Plan

The fire management plan should contain the following details:

- Plantation manager's telephone numbers;
- names and addresses of local fire control agencies;
- locality plans showing access roads, firebreaks, water points etc.;
- methods of access and firebreak maintenance;
- specific measures to protect services; e.g. power lines and gas pipelines;
- a fire fighting equipment register for the locality and details of cooperative arrangements;
- direction indicators to water points, road signs and other features;
- details of coordination and cooperation between plantation managers, local government authorities, local volunteer fire brigades DPaW and DFES in fire prevention, detection and suppression activities.; and
- a fuel reduction program, if applicable.

B. Plantation Harvest Plan

As a separate plan to the plantation management plan, a harvest plan is generally produced later in accordance with the haulage-management notification provisions outlined in Appendix 2.

This plan provides the relevant information for how the plantation is to be harvested. Harvest plans are dynamic documents and may change from time to time as a result of new information, new or revised laws, or for strategic or operational imperatives.

A plantation harvest plan should contain the following:

- harvest manager details;
- forest owner details;
- landowner details;
- customer details, work order numbers and timber products being harvested;
- a map of the harvest area;
- locations of plantation roads and tracks to be used and signage required;
- communication protocols to be used on site;
- emergency management protocols on site;
- the proposed harvesting system and machinery to be used for felling, processing and extraction;
- the establishment system to apply in the next rotation;
- slash management requirements from harvest;
- approximate dates during which harvesting is to occur;

- plantation haulage routes and public road haul route to timber receival facility to be used;
- fire protection preparedness, response and restrictions;
- wet weather restrictions to minimise soil damage;
- safeguards to protect significant values;
- minimum safety requirements; personal protective equipment required on site and warning notification for unannounced visitors; and
- hygiene measures preparedness, response and restrictions.

Appendix 2: Plantation Timber Haulage Notification to Local Governments and Other Road Managers

Introduction

Local governments and other road managers are seeking an assurance from plantation managers that the haulage of wood products does not adversely affect local roads within their control. They also seek to minimise conflicts with other road users.

Plantation managers are seeking to utilise the safest and most effective truck configuration for haulage to achieve maximum economy and to limit the number of truck movements on any road.

It is therefore important that a process be put in place that will enable the local road system to be managed in a coordinated and safe manner that enables issues of concern to all parties to be addressed in a timely and efficient way. It is considered that this can best be done by establishing a uniform, documented approach to the planning and implementation of mutually agreed actions.

It is the responsibility of the plantation manager or harvesting manager to complete all sections of the attached forms included in the Haulage and Haul Road (Route) Agreement and add any additional information required by the road manager. On reaching agreement for the haul route and the truck configuration, the plantation manager is to ensure copies of the signed document are given to each party, including the harvest or haulage contractor as specified in the plantation harvest plan.

This document forms part of the plantation harvest plan.

The post-harvest-inspection part of the form is necessary for the completion of the job and will form the basis for future trust and confidence between local governments, other relevant parties and the plantation industry. It will also facilitate cooperative negotiations on other haul routes.

Notification of Intention to Harvest and Haul

The process requires notification to be given to enable decisions to be taken by the relevant parties at appropriate stages both before and after the harvest taking place.

For example, notification is important for local government and/or road managers budgetary purposes, and to ensure the timely inspection of the condition of local roads that form part of haulage routes.

Primary Notification (Appendix 2A)

A primary notification to local authorities will be provided 18 months in advance.

This is intended to assist local governments and/or road manager to plan so that their works programs and budgets take account of any works associated with harvesting and to work with the plantation manager in resolving any issues of mutual concern.

Secondary Notification

The secondary notification to local authorities and/or road managers must be given when applying for multi-combination-vehicle permits prior to harvest operation commencement. Should vehicles not requiring special permits be used for the haulage operation, the harvest manager should advise the relevant local authority as a matter of courtesy. An example of the local authority agreement can be found in Appendix 2B.

The purpose of the secondary notification is to:

1. Confirm the commencement date for harvesting.
2. Enable the local government and the plantation manager or harvesting manager to complete a report on the state of the local roads being used for harvest haulage purposes.
3. Agree on the arrangements to be put in place to facilitate the haulage being undertaken in a safe and efficient manner.
4. Permit any other nominated agency to undertake an inspection of the haul route; e.g. MRWA.

Harvesting under Abnormal Circumstances

In the event of a natural disaster (wind, fire or disease) that causes damage to all or part of a plantation, making it necessary to salvage the crop, the plantation manager should notify the local government and/or road manager as soon as possible to make arrangements for the salvage process.

Post-harvest Notification

The post-harvest notification is for ensuring that the local government and/or road manager and the plantation manager undertake an inspection of the road immediately following the harvest and, where necessary, to rectify any extraordinary damage caused to the local roads by the haulage operation

Photographs could be taken to record the condition of the roads before and after haulage operations.

Notification Examples

The notifications provided in Appendix 2A and 2B are minimum requirements and should be used as a guide. Certain local authorities will have their own notification templates and these should be used when available.

Appendix 2A: First Notification to local governments

Chief Executive Officer

Address

For the attention of:

Dear,

SUBJECT: Notification of Intention to Harvest and Haul Logs on Shire Roads.

In accordance with the 'Code of Practice for Timber Plantations in Western Australia', *company name* herewith submits the *company name* haulage operations within the shire for the calendar year(s).

Please note that the list of plantations and subsequent roads are not definitive as throughout the year other growers may request harvest for various reasons outside the control of *company name*. Some of the plantations listed may not be harvested as indicated due to reasons both within and outside of *company name's* control. Consequently, this is the best estimate of those plantations likely to be harvested during the calendar year(s).

In most cases, *company name* will be seeking shire endorsement for the operation of multi-combination haulage (MCV) vehicles (pocket road trains, B-Double and truck and trailer configurations) to make the best economics of the haulage operation. In each instance, *company name* will consult with the shire before haulage operations and come to an agreement on the conditions for permits for the vehicle usage.

A *company name* representative will be in contact with your nominated representative to carry out pre-haulage inspections of shire controlled roads. Shire endorsement of conditions of haulage on these roads is required before Main Roads will issue a permit for MCV operations. *Company name* will be employing experienced contractors to carry out harvesting and haulage operations. Contractors will operate licensed, permitted MCVs with accredited drivers and documented operating systems. *Company name* will remain the responsible entity for conditional use of the shire roads, and as such, will sign off against the operating conditions of the permitted usage.

We trust that this assists your Shire on the planning and implementation of road works programs. Should you require any further information, please contact _____ on _____.

Yours sincerely,

Appendix 2A: First Notification to local governments

Shire of					
Notification of Haulage for 200...					
Plantation name	Location Number	Harvest Area (ha)	Total Harvest Volume (tonnes)	Haul Route	Approximate Timing

Appendix 2B: Haulage and Road (Route) Agreement

HAULAGE AND ROAD (ROUTE) AGREEMENT

Local Government: _____

Haulage and Haul Road (Route) Agreement

1. Plantation Name _____
2. Date of Inspection _____
3. Destination _____
4. Contractor (1)_____ (2)_____
5. Total Tonnes to be Harvested _____ Tonnes
6. Proposed Commencement Date _____
7. Duration of Operation _____
8. Delivery Schedule _____ per day
9. Type of Truck Configuration _____

Description of proposed haul routes and present status

Name of Road	Current Status (Class)	Comments

Agreement on Haul Route _____ Contractor
 _____ Local Government
 _____ Plantation Manager

11. Works to be undertaken prior to haulage

Name of Road	Plantation Manager	Local Government

12. Extra mass permit required _____ Yes/No

13. Date received and sighted _____

14. Other known road users

Names	Type	Details of Interaction including Timing	Notify: Yes/No

15. Post-harvest inspection report

Name of Road	Condition Now	Works Required	By Whom?

Works completed _____ exit _____ Yes/No

Completed and exited:

_____ Contractor _____ date

_____ Local Government _____ date

_____ Plantation Manager _____ date

Appendix 3: Aerial Spray Application Management Plan

1. Preamble

The plantation forest industry recognises that aerial application of pesticides to plantations might pose a threat to sensitive industries (e.g. fish farming, viticulture and berry farming) that occur adjacent to or near plantations targeted for spraying. However, it should be recognised that an outbreak of insect pests in a plantation has the potential to severely reduce growth and may cause mortality of the trees.

The objective of this management plan is to set the guidelines for the safe use of pesticides in plantations such that a owner/manager of a sensitive property, and other stakeholders are aware of the process that a target site owner/manager will follow before initiating action to control insect pests by aerial spraying.

The specifications for the application of pesticides by air will be documented in the attached *Field Specifications for Aerial Application of Insecticides to Plantations Located Adjacent to a Sensitive Property* (hereafter known as the field specifications).

The nature of plantations once they reach a height of eight metres or more precludes the use of ground-based equipment to apply pesticides. Aerial spraying is the only available technology that offers a viable means of controlling pest-insects in plantations. The plantation industry along with all other dry land farmers recognises the shortcomings of this technology and is actively researching alternative technologies.

The pesticides selected by the industry are those that are commonly used by other primary producers and have been shown to be extremely effective against the target insects. Only pesticides that are registered or subject to an off-label permit (issued by the National Registration Authority) for forest use will be used.

The plantation industry will take all precautions to avoid drift that might impact on neighbouring properties. The owner or manager of the target property will respond to genuine concerns from all neighbours and take tangible actions to avoid impacts on all neighbours. However, a target property owner/manager retains the right to act, within the constraints of legislation governing the application of pesticides by air, to take any action necessary to prevent damage to his or her plantation by insects (refer to The 'Breaches of Code' section, Disputes).

This plan will be adopted by all growers in the plantation industry and should form the basis for adoption by other industries that apply pesticides by air. This document will provide the guidelines for notification, liaison and the negotiation process with neighbours of target properties to ensure all genuine and sensitive issues are addressed in a consistent and acceptable manner.

2. Notifications

The requirements of the plantations industry to notify neighbours of an intended aerial spraying operation will follow a tiered approach as follows:

2.1 Standard Notification

This to be provided to the neighbour by the owner or manager of a target property no less than two weeks and no more than three months from the date that application of pesticide is anticipated. A written standard notification will be sent to each neighbour by mail or facsimile.

The standard notification will include:

- a preamble or overview of the insect problem, nature of the damage and likely impact on the tree crop;
- the identity of the target property;
- a description of insect pest;
- the identity of pesticides proposed for use;
- an estimate of the date of application; and
- weather conditions, including wind direction and speed, under which application is proposed.

The standard notification will invite concerned neighbours and owners of sensitive properties to contact the target property owner/manager for more information.

Simple agreements in relation to areas to be sprayed, wind direction and wind strength may be reached between the neighbour and the target property owner/manager following a standard notification.

2.2 Field Specifications

A field specification sheet (attached) is designed for a neighbour with a sensitive property. The field specifications will be prepared by the target property owner/manager following consultation with the owner or manager of a sensitive property and input from the pilot, with the primary objective of ensuring that sensitive activities on the property are not affected by spray drift. This approach will also ensure the owner or manager of a sensitive property is aware of planned spray activities, has an opportunity to comment on the development of the spray plan and can take any precautionary measures they choose.

The field specification must include the following detail:

Section 1: Details of parties involved in the development of the field specifications.

Section 2: Application conditions, including chemicals to be used, weather conditions, field communications and special protective measures.

Section 3: Record of application.

An owner or manager of a sensitive property who does not share a boundary with the target property may request a field specification be developed if, in the view of the sensitive property owner/manager, there is a risk posed by the aerial application of pesticides to an activity on his or her property. The onus is on the sensitive property owner/manager to request the development of a field specification

A register of sensitive properties at a district or local government level will allow a target property owner/manager to easily identify such properties. The maintenance of the register should be the responsibility of each local government.

2.3 Provision of Additional Information

Plantation growers will provide information to neighbours on request, which may include the following:

- material safety data sheets for pesticides and additives;
- relevant information from the department of health;
- information on insect pests of plantations;
- information on the efficacy of spray operations and impact of pesticides on both pest and beneficial insects;
- information on the impact of pest insects on plantation growth;
- data on aerial spray drift and appropriate management options; and
- tolerance levels for activities sensitive to pesticides.

2.4 Pre-application Contact

The owner or manager of the target property must make reasonable attempts to contact all neighbours and owners or managers of sensitive properties, by personal visit or phone, no less than 24 hours before an impending aerial spray operation.

Neighbours may choose to be excluded from a 24-hour notification. In this event a record of the arrangement must be kept by the target property owner/manager.

If the owner or manager of a sensitive property cannot be contacted, the matter should be referred to the Regional Protection Manager at the DAFWA who should be invited to observe the operations to ensure compliance with the field specifications.

3. Standards for the Application of Pesticides

3.1 Prescriptions

The plantation industry will develop standard prescriptions for the application of pesticides by aircraft that comply with accepted good practice and statutory requirements.

3.2 Pilot Accreditation

Aerial spraying contractors and pilots are to be accredited under the AAAA Operation Spraysafe scheme, and pilots must hold a current licence issued under the *Aerial Spraying Control Act 1966*.

3.3 Wind Speed

Aerial spraying will be carried out at wind speeds of 5 to 15 kph with maximum gusts up to 20 kph.

3.4 Public-drinking-water Source Areas

In PDWSAs: *Statewide Policy No. 2 Pesticide Use in Public Drinking Water Source Areas*.

(See drinkingwater.environment.wa.gov.au. Select Publications > Policies.)

4. Disputes

Where the field specification prepared by the target property owner is not considered by the owner or manager of a sensitive property to comply with the *Code of Practice for the Use of Agricultural Chemicals in Western Australia*, the sensitive property can refer the matter to the Regional Protection Manager, DAFWA for arbitration.

When a neighbour or a member of the community has reason to believe that they have been adversely affected by aerial spraying they may fill out an Agricultural Spray Incident Report Form available from local government and DAFWA Offices.

Field Specifications for the Aerial Application of Pesticides to Plantations Located Adjacent to a Sensitive Property⁸

Section 1: Details of Parties Involved in the Development of Field Specifications

1.1 Owner or Manager of the Sensitive Property

Name: _____

Location numbers: _____

Phone: _____ Mobile: _____

Fax: _____ Email: _____

Nature of sensitive activity to be protected. (Details of activity that is sensitive to pesticide contamination and reasons why the activity is sensitive):

1.2 Owner or Manager of the Target Site

Personal or company name: _____

Property or Site name: _____

Location numbers where applicable: _____

Phone: _____ Mobile: _____

Fax: _____ Email: _____

Name of field supervisor: _____

1.3 Pilot

Name: _____

Aerial Spraying Contractor name: _____

Phone: _____ Mobile: _____

Fax: _____ Email: _____

⁸ The field specification section of this document should not be separated from the preceding section

Section 2: Target Application Conditions

Proposed Date of Application

_____ day of _____ in the year _____.

Latest date of proposed spraying: _____

Target pest(s):

Common names(s): _____

Scientific name(s): _____

Chemical(s) to be Used

Before spraying commences, the landowner must be informed of the identity of the chemicals and any adjuvants to be used, and the application rate.

Pesticides

1. Brand name: _____ Rate (L/ha): _____

Active ingredient: _____

2. Brand name: _____ Rate (L/ha): _____

Active ingredient: _____

3. Brand name: _____ Rate (L/ha): _____

Active ingredient: _____

Additives

Name: _____ Rate (L/ha): _____

Name: _____ Rate (L/ha): _____

Total output: _____ (L/ha)

Reactive strips placed : Yes No

Agreed placement positions for strips: refer to attached map.

Target Weather Conditions

Wind Direction

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W
WNW NW NNW

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W
WNW NW NNW

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W
WNW NW NNW

Note: *Plans must be attached to this document showing locations of the target properties to be sprayed and the location of the sensitive property.*

Wind speed

(Maximum) _____ kph (Minimum) _____ kph

Temperature

(Maximum) _____ °C (Minimum) _____ °C

Relative Humidity

(Range) _____ % to _____ %

Spray Drift Awareness Zones

(The following is an extract from the *Code of Practice for the Use of Agricultural Chemicals in Western Australia*)

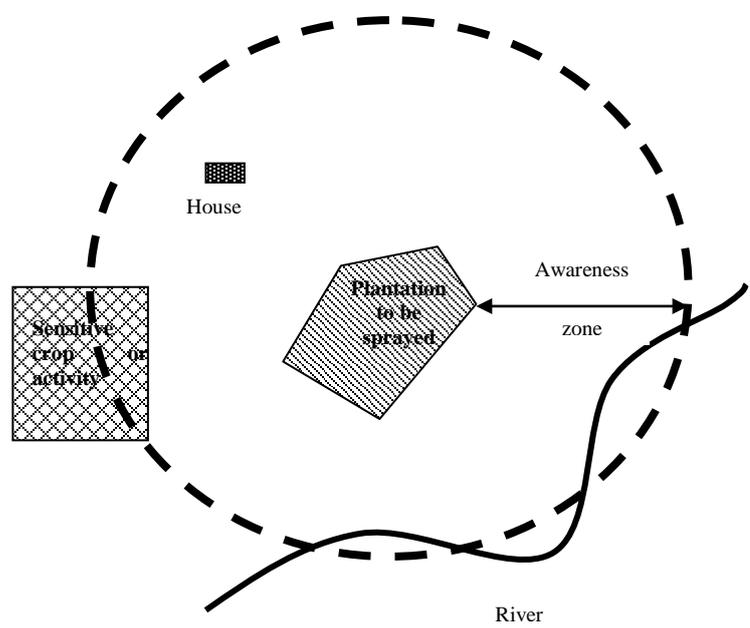
A spray-drift awareness zone (SDAZ) is a means of identifying and mapping all potentially sensitive areas around each paddock to be treated with chemicals. It is, in effect, a method of conducting a spray-drift risk assessment for your property.

Bear in mind that each part of the property to be treated will have a slightly different SDAZ as the focus of the zone shifts from paddock to paddock across the property.

Under most circumstances, the awareness zone for ground spraying could extend up to one km from the paddock to be treated. For aerial application, it is likely to extend well beyond that distance.

The SDAZs should take into account all buildings, crops or areas outside the paddock to be sprayed that may be potentially sensitive to spray drift; e.g. schools, dwellings, wetlands, aquaculture ponds, organic farms etc.

However, remember that the SDAZ is an *awareness* zone. It does not necessarily mean that spray drift damage will always occur within that zone, depending on the sensitivity of the crop or area, the weather and application conditions at the time of spraying, and the size of the Zone. Also, the presence of any physical or vegetative buffers downwind of the spraying operation will reduce the risk of damage.



Awareness zone establishment and sensitive-area identification.

Special conditions to be observed to ensure protection of sensitive property:

(Details must be supported by attached plans showing the location of any areas where spraying is to be excluded or where special care is warranted)

Field communications

Radio communication is to be maintained between the pilot and the field supervisor at all times during the aerial spraying operation. Communication is also to be maintained between the owner or manager of the sensitive property and the field supervisor. Any communication with the pilot is to be done through the field supervisor.

Agreed field communication between:

1. The field supervisor and the pilot (communications with the pilot can only be through the field supervisor):

Radio band and channel _____

2. The owner or manager of the sensitive property and the field supervisor:

Specify _____

If none to any of the above is available, what alternative arrangements are to be followed to maintain communications?

Nominated surrogate for owner or manager of the sensitive property (name and contact details):

Section 3: Record of Application

To be completed by the field supervisor after spraying is completed. Copies are to be provided to owner or manager of the sensitive property and to the pilot.

Actual Date of Application

_____ day of _____ in the year _____

Actual Weather Conditions

Wind Direction

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW
NW NNW

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW
NW NNW

Target property location no(s) where applicable _____

(Circle one or more) N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW
NW NNW

Wind Speed

(Maximum)_____kph (Minimum)_____kph

Temperature

(Maximum)_____°C (Minimum)_____°C

Relative Humidity

(Range)_____% to _____%

Reactive strips placed : Yes No

Results/Observations of strips: _____

Other relevant comments and observations:
