



Assessment of Code of Practice for Plantation Forestry: Western Australia

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Cover Photo: A *Eucalyptus globulus* plantation near Mount Barker, WA, that is set back from native vegetation and a major stream.

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1. SUMMARY

The Code of Practice for Timber Plantations in Western Australian (2006) and inter-related aspects of the forest practices system, including its implementation, were assessed for their effectiveness in meeting the 'Forest Practices Related to Wood Production in Plantations: National Principles'¹.

This Code is voluntary and was developed jointly by the plantation industry and Western Australian Government departments. It specifically addresses the National Principles. The State government does not formally endorse the Code, but it is used by local government as a basic requirement in assessing plantation development proposals, and it is used by all plantation companies as a minimum requirement to meet internal standards. The Code provides broad guidance on environmental care rather than specific prescriptions, and it applies to both public and private plantations. The Code lists all mandatory requirements of Commonwealth and State legislation. It also provides a basis for voluntary forest management certification.

We conclude that, in most respects, implementation of the Code in WA meets the intent of the National Principles.

We suggest some areas for improvement:

1. Develop detailed and consistent guidelines to assist local and state government agencies in assessing plantation proposals. This would require improved skills of staff employed by some local government bodies.
2. Develop three-year rolling plans for scheduling harvests, updated annually, by all major plantation growers and regions. This would assist local government to facilitate appropriate actions for building and maintaining infrastructure.
3. Include a goal relating to the effects of plantations on water yield, extend guidelines beyond those already associated with public-drinking water source areas, and provide guidance to plantation developers and managers on how to contribute to local and regional objectives for stream flows and ground water levels.
4. Strengthen provisions in the Code or guidance documents regarding the need to adopt harvesting and slash and litter management practices that retain organic matter and nutrients, and prevent soil erosion.
5. Specifically address the importance of training for field supervisors and other operators in environmental management. A coordinated and accredited training program, aimed at staff working at all levels of plantation management is suggested.
6. A State-wide program to assess and report Code compliance and environmental outcomes would enable continuous improvement of both the Code and plantation management. This could largely be met if existing auditing results from certification schemes were summarised and reported annually.

¹ <http://www.daff.gov.au/forestry/plantation-farm-forestry/principles>

2. BACKGROUND

Codes of forest practice are integral to developing and managing forest plantations in Australia. Their development and implementation are a responsibility of State and Territory governments. The Commonwealth Government has a role in sustainable forest management at the national level, which is implemented through various Acts, regulations and policies (Plantations2020 2007). These include:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Export Control Act 1982*
- Export Control (Unprocessed Wood) Regulations 1986
- Export Control (Hardwood Wood Chip) Regulations 1996
- Export Control (Regional Forest Agreements) Regulations 1997
- National Forest Policy Statement
- *Quarantine Act 1908*
- *Regional Forest Agreements Act 2002*
- Renewable Energy (Electricity) Regulations 2001

The Export Control (Unprocessed Wood) Regulations 1986 (section 4) requires the Federal Minister for Agriculture, Fisheries and Forestry to take into account the outcomes of a scientific assessment of a State or Territory code of practice in relation to its effectiveness in meeting the 'Forest Practices Related to Wood Production in Plantations: National Principles' (National Principles, Appendix A).

The outcome of this assessment is part of the decision making process by the Minister, if businesses in the State or Territory are to be exempt from requiring export licences for unprocessed wood as chips or logs. This assessment has been conducted in close consultation with the State and Territory agencies responsible for developing and administering the Codes, and with input from other relevant parties including local government, planning authorities, and public and private plantation forest owners or managers. Codes in all States and Territories were previously assessed by CSIRO (Acronyms, Appendix B) during 1996-2002 (Western Australia in 1997).

In July 2010, CSIRO was commissioned by the Department of Agriculture, Fisheries and Forestry (DAFF) to undertake a second assessment. In addition, after this assessment, CSIRO was requested by DAFF to comment on the National Principles (Terms of Reference, Appendix C). This report is our assessment of the Western Australian Code.

3. METHOD OF ASSESSMENT

3.1 General approach

The assessment followed a consistent approach across all States and Territories:

- Review of the scientific validity of the goals and guidelines contained in the Code, the way the Code is implemented, and how environmental performance and other aspects of compliance are monitored. The process did not fully evaluate environmental outcomes in the field, but observations at a sample of sites and discussions with stakeholders were used as the basis for assessing the impacts of forest operations on the environment.
- Effectiveness in complying with the National Principles was assessed against eight criteria based on responses to a set of questions exploring each criterion. These were agreed between DAFF, representatives of all States and Territories, and CSIRO at the outset.
- Review of the relevant regulations (e.g. planning) and guidelines applicable to the regional and local contexts that affect risk to environmental values.
- Discussions with key stakeholders.
- Visits to and discussions at representative sites where plantation forestry operations including harvesting could impact on the environment.
- In each State and Territory, we also sought information from organisations not concerned with wood production (e.g. Environmental Protection Authority, local government, and one or more Aboriginal organisations) that could advise on potential environmental impacts and provide comments.

Although this assessment is focussed on the Code, it also took into account guidelines, policies and regulations that contributed to overall environmental outcomes, e.g. State-wide environmental plans for biodiversity, catchment management plans, company internal processes, and forest management certification.

3.2 Approach in Western Australia

We gathered information during a visit to WA in May 2011, during which we consulted widely (Organisations consulted, Appendix D). Key documents reviewed include:

- Code of Practice for Timber Plantations in Western Australia (Forest Industry Federation of WA (FIFWA 2006, hereafter referred to as the Code).
- Shire of Manjimup Agroforestry and Tree Plantation Issues Paper (2005)
- Plantation Forestry and Water Management Guidelines (Department of Water, DoW 2009)
- Guidelines for Plantation Fire Protection (Fires and Emergency Services, FESA 2001, and a draft revision)
- Contractor's Timber Harvesting Manual Plantations (Forest Products Commission, FPC 2005)
- Forestry on Private Property (Department of Environment and Conservation, DEC, 2010)

- Documents used to support plantation planning and operations. These included, maps of the proposed areas (total and plantable), and information on native vegetation, soil, water, terrain, and heritage values.
- Audit and compliance reports of performance against voluntary certification standards that were provided by several major plantation companies
- Plantation management guidelines used by major plantation companies

Field visits and discussions with managers and supervisors provided opportunities to explore how the Code and related regulations were applied.

The distribution of plantations in WA is shown in Fig. 1. Western Australia has the largest plantation area of any State or Territory, with about 0.40 M hectares (approximately 75% *Eucalyptus* and 24% *Pinus*, and small areas of a few other species), which represents 21% of the national estate of 2 M hectares (Gavran and Parsons 2011). Most commercial plantations are within the higher rainfall areas (650-800 mm annually) of the south-west of the State. The eucalypt plantations are managed for pulpwood on 12- to 18-year rotations. The pine plantations are managed mainly for saw logs on 20- to 30-year rotations. There are small areas of sandalwood plantations in the Ord River valley (northern WA, not shown in Fig. 1) and near Mount Barker (southern WA).

3.3 CSIRO Team

The CSIRO team consisted of Philip J. Smethurst (Project Leader), John Raison, Sadanandan Nambiar, and Brad Moggridge, which covered all fields of expertise required and it specifically included sustainable plantation management, soils, nutrition, hydrology, biodiversity, conservation, and cultural heritage. Smethurst, Raison and Nambiar participated in the field visits. Moggridge conducted a desk-top assessment of cultural heritage values, including contact with relevant stakeholders.

3.4 Discussions and field visits

The team visited WA for five days (Meetings and field visits, Appendix E). During this visit and follow-up contacts with key stakeholders (Appendix D) we gathered the information required to assess the Code.

4. INTRODUCTORY COMMENTS ON THE WESTERN AUSTRALIAN CODE

The Code was developed by FIFWA in consultation with the private plantation industry, FPC, and DEC. It is a voluntary Code (not legislated) that was developed to set a standard for plantation management that local government could rely on to meet the National Principles, and to assist growers to improve environmental management. Major sections of the Code describe its purpose and scope, the National Principles, other principles, acts and regulations, goals and guidelines of plantation management. Templates are included that can be used to plan haulage, spraying and some other management operations. Both mandatory (as required by a State or Commonwealth government Act or regulation) and non-mandatory requirements are described.



Figure 1. Map showing the location of plantations in Western Australian (Gavran and Parsons 2011). Hardwood plantations are shaded as green, and softwoods as red.

Implementation of the Code is the responsibility of the plantation manager or owner. However, processes for plantation approvals adopted by local government, and certification schemes used by most large plantation growers, require that plantation management complies with the Code. Additional requirements can be imposed by local government or certification schemes. Thus, the Code plays an important and underpinning role in plantation forest practices in WA.

5. CRITERION 1: COMPLIANCE OF PLANTATION MANAGEMENT WITH RELEVANT PLANNING SCHEMES AND LEGISLATION

5.1 Relevant National Principles and Questions

National Principle: 1.3

1.3 Plantation management should comply with State and regional conservation and catchment management objectives, relevant planning schemes and legislation.

a) Are the processes adequate to meet this criterion?

5.2 Existing Processes

The authority to approve plantation developments rests with the local government. Approvals are required in most areas where plantations are treated as a change of land use. In accordance with *The Planning and Development Act 2005*, the Department of Planning sets state-wide policy and guidelines that local government use for evaluating plantation proposals. These guidelines are now under revision. The State's broad policy is that plantations should be an approved use of land within areas zoned for rural use, but that local governments should regulate the extent and location of such plantations within their planning framework. However, one important issue is that amongst the 139 local government bodies, there is a wide range of interpretation and acceptance of plantations as a land use. As a result, we were told, similar plantation development proposals, when lodged with different local governments tend to receive different types of responses and outcomes. Occasionally plantation managers appeal a decision to reject a proposal. These appeals are heard by the State Administrative Tribunal and commonly upheld in favour of the applicant resulting in a permit. Compliance with the Code is a requirement stipulated by local government.

Proposals to establish new plantations include a plantation management plan, a projected harvesting schedule, and a fire management plan. When necessary, proposals may be referred to relevant state agencies for advice on potential impacts on native vegetation, fire management and water issues. Proposals are also announced in local newspapers seeking public comments within 28 days.

After harvesting, companies usually inform local government if there is an intention to replant, but formal approval is not required.

One of the plantation regions within the State that is administered by several local governments has developed a three-year rolling plan for harvest scheduling, which was facilitated by a Timber Industry Road Evaluation Study. Other local governments indicated a desire to adopt such a rolling plan.

5.3 Comments on Existing Processes

The unpredictability of local government attitudes towards plantation developments is seen as a source of uncertainty by plantation growers. New state-level draft planning guidelines, which are in the late stage of development, have the opportunity to address this concern. However, our assessment is that it will not achieve this outcome as the suggested wording will continue to allow a high degree of discretion by local government. As examples, two passages from these draft guidelines are shown here, in which we have underlined the areas of discretion:

- *Tree farming is a permitted use on rural land, but should generally not be permitted on land identified as priority agriculture;*
- *Local governments may wish to manage the location and extent of tree farming in their communities through either local planning strategies or local planning policies;*

While assessing plantation proposals, local governments pay most attention to roads, waste management, and fire management. The Code provides little specific guidance for local

government on other issues, and local government tends to assume that most other National Principles will be catered for adequately, if proponents comply with the Code.

Local and state government agencies have little or no capacity to monitor environmental outcomes or audit compliance with the Code or other conditions specified in local government planning permits. Local government officers sometimes check on fire break maintenance before each summer. However, our discussions and field visits confirmed that major plantation companies have implemented sound planning and operating systems, including auditing by internal systems and external auditing to maintain certification. There is some reporting of environmental ‘incidents’, with actions taken to deal with them, and the learnings are used to improve management over time.

5.4 Scope for Improvement

It would be valuable to reduce the variation between local governments in their assessment processes for plantation proposals and be guided by a uniform, state-wide set of criteria and guidelines.

At present, only summary audit reports of voluntary certification schemes are available publicly. If a state-wide summary of the detailed auditing outcomes was available it could assist in two important ways. Firstly, it would assist with the identification of patterns, if any, of poor and sound environmental performance. In the case of poor outcomes, improved approaches can be incorporated in Code revisions and in forestry operations. Secondly, it would summarise environmental performance at a State level. Hence, publication of an annual State-wide summary is recommended, and, to be cost efficient, this process should be built on existing certification auditing efforts.

It would be useful if all plantation companies provided local government with a three-year rolling plan, updated annually, of the expected harvesting schedule. This would facilitate forward planning for investments in road maintenance.

5.5 Conclusion

The Code and the relevant implementation processes for approving and managing plantation forests in WA are adequate for meeting most aspects of criterion 1. Suggested improvements are:

- Develop consistent state-wide guidance to assist local government better implement the Code.
- Local government should be informed well in advance of plantation harvesting plans. We suggest development of three-year rolling plans covering all major plantation growers and regions, with an annual up-date as inputs for improving investments in roads.
- Introduce a system of annual, state-wide reporting of Code outcomes that builds on existing auditing processes.

6. CRITERION 2: PROTECTION OF NATIVE VEGETATION AND ANIMAL COMMUNITIES AND NATURAL LANDSCAPE VALUES

6.1 Relevant National Principles and Questions

National Principles: 1.1, 1.2 and 1.8, except for cultural heritage values, which are considered in Criterion 5

- 1.1 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.
- 1.2 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.
- 1.8 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.

- a) Are the processes for managing the clearing of native vegetation adequate to meet the objectives of the National Forest Policy Statement (including the objective of not clearing for plantation establishment where this would compromise regional conservation and catchment management objectives)?
- b) Do these processes take into account the need to achieve adequate conservation of important natural heritage values?
- c) Are there measures and processes in place for the identification of these values in assessing proposed plantation sites and adjacent areas for natural values?
- d) Where values are identified are protection measures taken into account in the planning and future management of plantations?
- e) In the planning of plantation layout and establishment operations, are there measures and processes for managing identified natural heritage values, including the protection of threatened species and communities?

6.2 Existing Processes

Clearing of native vegetation, over more than one hectare per property, for conversion to forest plantation is contrary to WA government policy and regulated under the *Environmental Protection Act 1986*. If clearing is proposed, it is assessed against a set of ten principles described in Schedule 5 of the Act. Proposals for plantations must include an evaluation of the potential impacts on native vegetation, visual impact, and other aspects of this criterion. All native vegetation clearing requires a permit from DEC. All native vegetation to be retained at a proposed plantation site is clearly marked on maps for use by the plantation developer, local government, DEC, contractors and other stakeholders. Local government refers proposals to

DEC if a plantation development is likely to affect native vegetation values. Permits are provided if, individual or small patches of trees need to be removed for personal safety or fire protections reasons, and if such removal does not jeopardise the conservation status of a native plant community or habitat for native fauna.

6.3 Comments on Existing Processes

The assessment and implementation processes for this criterion are implemented thoroughly. The access to DEC staff is regionally-based, which according to some growers results in large variation in both the time taken for a response and the nature of the advice. As noted earlier, it was reported that local governments also vary greatly in their attitude towards plantation proposals, including the conditions attached, if approvals are granted.

6.4 Scope for Improvement

The critical criteria and processes for assessing a plantation proposal should be brought to a satisfactory degree of uniformity across the local government and State government departments. This can be achieved by developing a clearer set of transparent guidelines for the plantation approval process, and thus reducing the discretion of DEC officers based in regions and those managing the process in local governments.

6.5 Conclusion

We conclude that the Code content, related legislation and processes of implementation collectively provide an adequate basis for protecting animal and native vegetation communities during plantation development and management in WA. More uniformity across regions in Code application is required.

7. CRITERION 3: PROTECTION OF WATER QUALITY AND, WHERE REQUIRED, MANAGEMENT OF WATER YIELD

7.1 Relevant National Principles and Questions

National Principles: 1.4 and 1.5

- | | |
|-----|---|
| 1.4 | Water quality (physical, chemical, or biological) should be protected by measures controlling change resulting from plantation activities |
| 1.5 | Water yield should be managed as required by careful planning of operations. |

- a) Do measures that protect water quality include streams, springs, soaks, swampy ground and bodies of standing water, and minimise sediment and other contaminant input to streams from plantation areas including roads?
- b) What environmentally sound guidance regarding plantation management strategies for the use of nutrients and biocides do the codes of practice provide especially to ensure that changes to water quality are within acceptable limits?

- c) Where the water resource is required to be managed (for example, controlled catchments), do the codes of practice provide effective strategies for managing water yield?

7.2 Existing Processes

Local government assessment of a plantation proposal includes inputs and advice from DoW, if required, on potential impacts of the proposal on water quality or water quantity. Plantations established in parts of the landscape that were predominantly under agriculture have been demonstrated to improve water quality (e.g. reduced salinity, turbidity, bacteria or phosphorus; Smethurst and Petrone 2010, Smethurst and Neary 2010), which is major concern in WA (DoW 2009, Weaver et al. 2001). In addition, the Code includes guidance that keeps risks to water quality at a low level, e.g. through specification of buffer zones, slope limits, and in some cases restrictions on machine use.

The Code does not include a goal in relation to water yield. However, the potential impact of plantations on water quantity (stream flow or ground water levels) is examined during the assessment of plantation proposals, particularly if the proposal is in an area proclaimed as a source of drinking-water. There are water allocation plans for ground water or surface water for several regions where plantation developments have been in progress. These plans are used by DoW to provide advice to plantation developers and local government.

When a proposal might influence areas of acid-sulphate soils, or impact river or wetland ecology, DEC provides advice to local government and plantation managers, and makes decisions on land management in relation to water if required under the *Environmental Protection Act 1986*.

7.3 Comments on Existing Processes

The Code provides minimal recognition of the potential effect of plantations on water yield. The plantation industry is concerned that water-use regulations for plantations will be introduced that do not apply equitably to all land uses. Current advice on water quantity is limited by a lack of knowledge to predict the effects on water yield of multiple land uses including plantations. Despite these uncertainties, attempts are being made to increase water yield by modified harvesting of plantations and native forests. For example, thinning of native forests is permitted in some circumstances where there is a need to increase the availability of water for other purposes, e.g. drinking water in Manjimup Shire. Also, increased thinning, or clearfelling without re-planting, of some pine plantations is encouraged, e.g. in the Gnangara groundwater areas north of Perth, because it is expected to increase groundwater recharge.

There has been considerable investment in water quality monitoring and research in WA in relation to plantations and other land uses (e.g. McKergow et al. 2003, Weaver et al. 2001). This work has shown that plantations can reduce salinity and sedimentation of stream water, which are positive outcomes, and DoW recommends plantation establishment for improving water quality (Keipert et al. 2008).

7.4 Scope for Improvement

We have no comment for improving the Code in relation to water quality outcomes, but there needs to be a goal and improved guidance in relation to effects on water yield.

7.5 Conclusion

The Code, related legislation, and their implementation are adequate to meet the water quality aspects of this criterion. A goal needs to be included in relation to water yield, and the guidelines on this aspect should be extended beyond those already associated with public-drinking water source areas.

8. CRITERION 4: PROTECTION OF SOIL RESOURCES

8.1 Relevant National Principles and Questions

National Principles: 1.6 and 1.7, except cultural heritage values are considered in Criterion 5

1.6 Soil stability should be protected by measures, which regulate site disturbance.

1.7 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

- a) Are there measures and processes in place to assess the risks to soil resources? How are differences in soil type, topography and climatic conditions taken into account?
- b) Do the codes of practice provide guidelines for roading, harvesting and site preparation that minimise soil loss or adverse change to soil properties?

8.2 Existing Processes

The Code provides very little guidance on the protection of soil values. It provides only broad goals and guidance on soil protection, e.g. it is pointed out that site preparation activities must comply to the requirements of the *Soil and Land Conservation Act 1945*. It also recommends that cultivation lines be along contours to minimise the potential for erosion.

8.3 Comments on Existing Processes

We observed two instances of erosion, where heavy rain followed wildfire and the drainage system failed, i.e. gully erosion below culverts in one case, and sheet erosion displaced surface soil in the other. In one case, company staff followed internal procedures and reported this event, demonstrating staff awareness of soil erosion risks. Such extreme events cannot be completely managed, even with expensive improvements to fire prevention, and drainage designs. However, if this combination of weather and site conditions is common, it will damage soil, and possibly water values as well. We also observed severe erosion along a road resulting

from an inadequate drainage system. The design of roads and drains might need to cater for larger scale and more frequent rainfall events.

We found that plantation managers give inadequate attention to the impacts that whole-tree harvesting or slash removal can have on site organic matter and nutrient reserves and the productivity of future plantations. Although such practices are not mentioned in the Code, it has been in some certification audit reports. We found that the burning or removal of slash has left some sites exposed to a high risk of soil erosion and organic matter and nutrient depletion. We did observe significant sheet erosion following harvesting and hot fire at a eucalypt plantation site on private land. The event did not seem to be documented, which raises concern as to whether such soil damage is more widespread.

Plantation forestry is not identified as a major cause of soil erosion in WA compared to other land uses. However, because of State government staffing limitations there is no monitoring of soil erosion in plantations. Certification schemes adopted by the major plantation companies fill this gap to some degree, because they include an annual field inspection of environmental values, including soils. Audit reports shared with us did not raise concerns about the soil resource, apart from the implications of slash management.

8.4 Scope for Improvement

Whole tree harvesting, windrowing and burning of slash and litter leads to major displacement or loss of organic matter and nutrients, and increased erosion risk, which poses a risk to soil and water values and future plantation growth. These impacts are strongly influenced by site and soil conditions. The Code and supporting documents should provide clear recognition of the risks and guidance on best-practice harvesting and slash management.

8.5 Conclusion

We suggest that the Code should strengthen the deployment of roading, harvesting and slash management guidelines to minimise damage to soil and water resources and future plantation growth.

9. CRITERION 5: PROTECTION OF CULTURAL HERITAGE VALUES

9.1 Relevant National Principles and Questions

National Principle: NP 1.7 and 1.8, cultural heritage aspects only.

- | | |
|-----|---|
| 1.7 | 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 |
| 1.8 | 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. |

- a) In the planning of plantation layout, establishment and maintenance operations, are there measures and processes for managing cultural heritage values?

9.2 Existing Processes

The Code indicates that cultural heritage values in the State must be protected under the WA *Aboriginal Heritage Act 1972*, the WA *Heritage of Western Australia Act 1990*, and Commonwealth *Native Title Act 1993*. No guidance is given on how to achieve this outcome, except to pay attention to it in plantation management plans. The planning manuals of large plantation companies require their staff to check for cultural heritage values during the preparation of management plans, and to include appropriate zones of protection around them. Some manuals provide electronic links to WA government websites from where relevant information could be obtained for the proposed area. It is expected that a new search be conducted by the plantation manager prior to commencing each rotation. Some plantation companies conduct cultural heritage awareness training for staff about every two years. When more local knowledge is needed, Aboriginal representatives or others responsible for protecting heritage are consulted. Important sites are clearly marked on maps that are part of plantation management plans.

We were advised that so far no case of harm or disturbance to a heritage value has been reported as a consequence of plantation operations.

9.3 Comments on Existing Processes

The WA government on-line information might not be comprehensive or up-to-date, and the local Aboriginal representative might not be familiar with the specific area in question. In some cases, the Aboriginal community has been unwilling to divulge the exact location of a significant place. Despite these complications, to-date no serious breaches or other problems of conflict with cultural heritage values have arisen in relation to plantation activities in WA.

Without input from the local Aboriginal community, the discovery of new Aboriginal objects or places is at the discretion of those working or planning work at the site. It is then the responsibility of these parties to ensure that they are appropriately trained and informed of requirements of the relevant heritage legislation. However, it is likely that not all operational staff are familiar with this obligation and the required process to protect objects or places if a suspected artefact or site is discovered during operations.

9.4 Scope for Improvement

The Code should be updated to provide more guidance on identification and protection of heritage values and the responsibilities of plantation managers and field operations staff.

9.5 Conclusion

Current implementation processes are adequate to protect cultural heritage values on cleared agricultural land. Code content could be improved by including more operational guidance in relation to protecting heritage values.

10. CRITERION 6: PROTECTION FROM FIRE, PESTS AND DISEASES

10.1 Relevant National Principles and Questions

National Principle: 1.9

1.9	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.
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- a) Do the codes of practice provide for fire management plans for plantations including containment from adjacent native forest?
- b) Do the codes of practice provide guidelines to deal with outbreaks of pests and diseases?

10.2 Existing Processes

The responsibilities for fire prevention and suppression are covered in detail within the Code as required under the *Bush Fires Act 1954*. This Act is administered by FESA according to their Guidelines for Plantation Fire Protection 2001. The guidelines include plantation planning for access, fuel management, and access to water for fire control. They also cover equipment and staff needs, and a strategy for regional coordination. This information is used by proponents to develop plantation proposals, and by local government to assess these proposals. If necessary, local government can request FESA to comment and provide advice on plantation development proposals. These guidelines are currently under review.

The Code provides goals and general guidance for the detection and control of pests, diseases and weeds. Examples include guidance for the use of integrated pest management systems, chemical use, spread of wildlings from plantations, and control of weeds. These aspects are checked for compliance during certification audits.

10.3 Comments on Existing Processes

Weeds and pests cannot always be completely controlled or eradicated from plantations due to technical or financial limitations. For example, in one case we observed a heavy infestation of blackberry within a plantation that might have been the source of an incursion in the adjacent property. This problem, however, is not limited to areas under plantations. We note that plantation managers devote considerable effort in general towards weed management.

The plantation industry is generally well-coordinated for managing fire. However, FESA is concerned about the potential increase in fire risk from plantations established exclusively for carbon credits, because of the perception that they might have inadequate fire management plans. If the areas of non-industrial plantations increase, it might become necessary to specifically address this in the Code.

10.4 Scope for Improvement

Implementation of regional weed control strategies by all land users would help reduce the weed problem. Also, the Code might need to clarify fire management requirements for plantations established exclusively for carbon credits.

10.5 Conclusion

Existing Code content and implementation processes deal adequately with protection against fire, weeds, and other pests within plantations. Some weed invasion requires adoption of regional-level control measures. Fire management in relation to plantations established exclusively for carbon credits needs more attention, if these areas expand.

11. CRITERION 7: TRAINING FOR ENVIRONMENTAL CARE

11.1 Relevant National Principles and Questions

National Principle: 1.10

1.10 Operators will be trained in the principles of environmental care.

a) Are the processes adequate to meet this criterion?

11.2 Existing Processes

The Code provides general goals and guidance for training to meet best management practices, including both environmental care and safety.

11.3 Comments on Existing Processes

It is recognised in the Code that it is essential that staff working at all levels are adequately trained to interpret and implement best management practices. This goal is achieved by large plantation companies, but we have not assessed the capacity of small growers in this regard.

11.4 Scope for Improvement

Code effectiveness is likely to be enhanced if all practitioners, including machine operators and other contractors, are well informed of the key principles and practices of environmental management. There is merit in developing co-ordinated and accredited training programs built on different modules and this may be best achieved by a joint effort between plantation companies and Government agencies.

11.5 Conclusion

The plantation industries are paying adequate attention to training in safety. However, training needs of field supervisors and operators in environmental management should be emphasised in the Code.

12. OTHER NATIONAL PRINCIPLES

There are a further 23 National Principles (NPs), but many of these overlap with those of Environmental Care dealt with in earlier sections of this report. In this section, each of these additional NPs is listed and a 'Comment' added if a principle has not already been addressed.

12.1 NP2. SAFETY

2.1 All plantation establishment, management and utilization 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.

Comment: This principle restates a provision that exists under Commonwealth and State worker safety legislation. Large plantation companies have safe working practices that go beyond the minimum requirements. We did not explore to what extent small growers and agro-forestry operators have adopted safe practices or provide safe working conditions to employees.

12.2 NP3. PLANNING

3.1 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.

3.2 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.

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

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

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

Comment:

The main purpose of the Code is to foster plantation development with environmental care. The Code notes the contribution that plantation forestry makes to social and economic values, but it does not emphasise the need for economic operations. Environmental effects of plantations are considered earlier in this assessment (sections 5-10).

The Tree Plantations Act 2003 ensures an automatic 'right to harvest' plantations in WA. This legislation is also relevant to the separation of ownership of plantations and land. Separation of ownership of carbon (as a 'product' of a plantation) is covered by the Carbon Rights Act 2003.

12.3 NP4. ACCESS

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

4.2 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.

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

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

Comment: Roads are well recognized in the Code as a major potential environmental risk, and are dealt with in several sections. In relation to road planning external to the plantation, i.e. those roads provided by local government, a long term harvesting plan would facilitate road planning. Other aspects of these principles on access have been addressed earlier in this report (sections 7-8).

12.4 NP5. ESTABLISHMENT AND MAINTENANCE

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

5.2 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.

5.3 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.

Comment: The potential contribution of plantations to economic values is recognized in the Code, but no guidance is given. It is therefore assumed that plantation managers will make only sound economic decisions, including those involving species, site and silviculture. Local government assessment takes into account social and economic sustainability of a plantation proposal. Recent developments in the managed investment sector of the plantation industry in WA (and in several other states) brings into question the attainment of principle 5.1. However, this aspect was outside the scope of our assessment. Other aspects of these principles on establishment and maintenance have been addressed earlier in this report (section 10).

12.5 NP6. TIMBER HARVESTING

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

6.2 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.

6.3 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.

6.4 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.

Comment: These principles on timber harvesting have been addressed earlier in this report (e.g. section 5)

12.6 NP7. FOREST PROTECTION

7.1 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.

7.2 Plantation health surveillance should be undertaken on a regular basis.

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

7.4 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.

Comment: These principles on forest protection have been addressed earlier in this report (section 10).

12.7 NP8. MONITORING AND REVIEW

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

8.2 The National Principles should be reviewed and evaluated after three years.

Comment: There is no state-wide systematic monitoring, auditing and reporting of Code compliance or the attainment of environmental objectives. However, large plantation companies are certified under the Australian Forestry Standard or the Forest Stewardship Council. These certification schemes require annual audits, but detailed audit results are not publicly available. Local government sometimes checks the condition of fire breaks prior to the fire season, which can result in a request for corrective action by the land owner.

A system of auditing should be extended to non-certified growers. The value of auditing would increase if there was a systematic, state-wide process to capture the lessons on an annual basis and to use them to improve management practices and the Code.

An evaluation of the National Principles will be conducted after all State and Territory codes of practice for plantation forestry have been assessed.

13. ACKNOWLEDGEMENTS

Rebecca Sharp, Peter Beatty and other FPC staff provided substantial assistance with background documents and coordination of meetings and field visits. Staff from other organisations consulted (Appendix D) were also very helpful in facilitating this assessment.

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APPENDIX A – NATIONAL PRINCIPLES

FOREST PRACTICES RELATED TO WOOD PRODUCTION IN PLANTATIONS: NATIONAL PRINCIPLES

PREAMBLE

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 et 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.

1. PRINCIPLES OF ENVIRONMENTAL CARE

1.1 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.

1.2 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.

1.3 Plantation management should comply with State and regional conservation and catchment management objectives, relevant planning schemes and legislation.

1.4 Water quality (physical, chemical, or biological) should be protected by measures controlling change resulting from plantation activities

1.5 Water yield should be managed as required by careful planning of operations.

1.6 Soil stability should be protected by measures, which regulate site disturbance.

1.7 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.

1.8 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.

1.9 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.

1.10 Operators will be trained in the principles of environmental care.

2. SAFETY

2.1 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.

3. PLANNING

3.1 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.

3.2 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.

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

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

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

4. ACCESS

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

4.2 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.

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

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7.4 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.

8. MONITORING AND REVIEW

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

8.2 The National Principles should be reviewed and evaluated after three years.

APPENDIX B – ACRONYMS

CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DEC	Department of Environment and Conservation
DoW	Department of Water
FESA	Fire and Emergency Services Authority
FIFWA	Forest Industries Federation (WA)
FPC	Forest Products Commission
NP	National Principle
WA	Western Australia

APPENDIX C – TERMS OF REFERENCE FOR CSIRO

In undertaking a review of Codes of Practice for the states and territories for assessment against “*Forest Practices Related to Wood Production in Plantations: National Principles*”, (National Principles), the CSIRO will:

1. By December 2011, assess codes of practice for measures and processes for the protection of environmental values. This will include:
 - the scientific quality of the measures
 - their method of implementation
 - adequacy of procedures for auditing, monitoring and securing compliance.
2. Provide a statement on the measures and processes that are in place that address each National Principle.
3. Identify if new measures and processes or modifications are required to adequately address the any National Principle.
4. Prepare draft reports for comment by the Commonwealth and the relevant State/Territory following each assessment.
5. Prepare a final report for the Commonwealth and the relevant State/Territory following revision of the draft reports.
6. Provide assessment of areas to be considered for updating the National Principles following completion of all assessments.

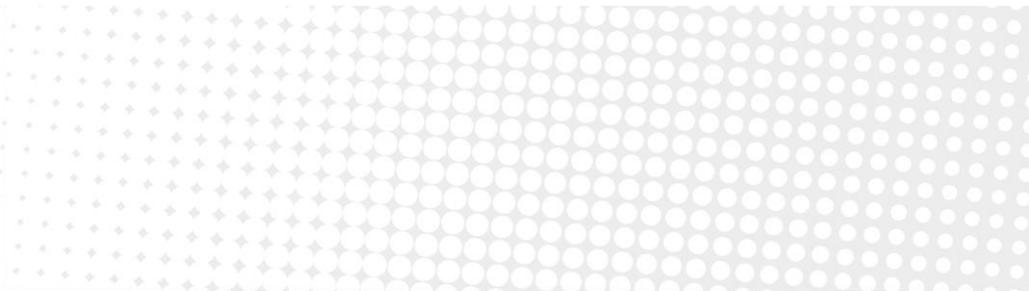
APPENDIX D – ORGANISATIONS CONSULTED

Australian Bluegum Plantations
Australian Forest Growers
Albany Plantation Forest Company of Australia
Department of Agriculture and Food
Department of Planning
Department of Water
Elders Forestry
Environmental Protection Authority
Forest Industries Federation (WA)
Fire and Emergency Services Authority
Forest Products Commission
Gunns Limited
Hansol
Plantall
WA Plantation Resources

APPENDIX E – MEETINGS AND FIELD VISITS

Visit 9th-13th May 2011

Monday 9 th	Meeting with FPC staff, Perth Inspect pine plantations in the Gnangara area
Tuesday 10 th	Meetings with plantation companies and FPC Field visits in the Blackwood Valley area: pine plantations
Wednesday 11 th	Meetings with Manjimup and Nannup Shires, and Australian Forest Growers Field visits in the Manjimup area with Manjimup Shire, and in the Mount Barker area with Gunns' eucalypt plantations
Thursday 12 th	Meetings with plantation companies and FPC Field visits with a plantation company and FPC
Friday 13 th	Meetings with FIFWA, FESA and Department of Agriculture and Food WA



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CSIRO and the Flagships program

Australia is founding its future on science and innovation. Its national science agency, CSIRO, is a powerhouse of ideas, technologies and skills. CSIRO initiated the National Research Flagships to address Australia's major research challenges and opportunities. They apply large scale, long term, multidisciplinary science and aim for widespread adoption of solutions.