



Assessment of Code of Practice for Plantation Forestry: South Australia

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Cover Photo: A view of small-diameter *Pinus radiata* logs after a first thinning operation. Many pine plantations in this region are in their third rotation are substantially more productive than in previous rotations. Sustained or increased production is possible through careful management of site resources, despite sandy soils with inherently low nutrient availability.

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1. SUMMARY

The Code of forest practice in South Australia (Guidelines for Plantation Forestry in South Australia, 2009) 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. The Code was established in consultation with stakeholders, and is outcome-focused. It is not legislated, but is endorsed by State government through the Minister for Forests. It identifies the legislated mandatory requirements and describes some forest industry practices that are expected to achieve these requirements. The Code is voluntary and thus it is not necessarily subject to compliance auditing or to the assessment of environmental performance, apart from risk-based compliance assessments by relevant government departments. In addition, all major growers are certified through one or more internationally recognised forest management certification schemes that are regularly audited for performance.

The Code does not provide detailed guidance on how to achieve desired outcomes. Instead, major plantation growers back up the Code with detailed operational guidelines.

There is good co-operation between local government and large plantation companies during the plantation planning (approval) phase and companies are motivated to achieve high environmental standards.

The Environment Protection Authority, two local government bodies, and a catchment management authority, reported that there was no major environmental degradation resulting from plantation forestry, including application of the Code. Hence, the system seems to be achieving the national principles of environmental care.

Further improvements that would provide increased confidence in the outcomes sought by the Code are:

- linking the Code more clearly with adequate supporting documents such as management prescriptions that are made readily available to all growers,
- introducing a requirement to provide to local government every 1-2 years a 3-5 year rolling plan for wood harvesting,
- introducing a system of State-wide auditing of Code outcomes through a systematic process to capture the degree to which the Code is used and environmental goals are achieved, and
- strengthening regional water planning to better manage the impacts of plantations and other land uses on water resources, especially those impacts that may affect off-site availability and wetland ecosystems.

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:

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

- *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 (South 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 South 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. Environment 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 South Australia

Our work in South Australia was facilitated by the Department of Primary Industries and Resources South Australia (PIRSA). We gathered information during a visit to the Mount Gambier region, during which we consulted widely (Organisations consulted, Appendix D). Key documents reviewed include:

- The Guidelines for Plantation Forestry in South Australia (PIRSA 2009) (hereafter referred to as the Code). The Code summarises mandatory requirements as well as forest industry practices that aim to provide satisfactory environmental outcomes. They encourage plantation growers to plan, establish, manage, and harvest plantations so as to achieve sustainable outcomes.
- Industry strategy document (FIDB 2010).
- Water and other natural resources policy and planning documents (Government of South Australia 2009, SENRM 2010).
- Parts of a detailed internal manual that is used by ForestrySA to guide operations in a manner consistent with the Code mentioned above. A chapter on environmental management has recently been added to the manual (ForestrySA 2010).
- A ForestrySA regional biodiversity planning document (Horn 2003)
- A harvest plan prepared by Gunns Ltd. for harvesting Tasmanian blue gum plantations on private land.
- Management plans prepared by ForestrySA for harvest and re-establishment of pine plantations.

Field visits and discussions were conducted with local forest managers to understand how the Code and related regulations are applied to achieve the intent of the National Principles. Field visits provided detailed accounts using contrasting case studies – including modified re-

establishment of pine forests to assist conservation of remnant native forest and the protection of wetlands, and the harvesting of Tasmanian blue gum plantations for pulpwood on private land. We had the opportunity to interact with a harvesting supervisor and to assess the extent of their understanding of and commitment to the Code.

A map showing the distribution of plantations in South Australia is provided in Fig. 1. In 2010, South Australia had about 0.19 M hectares of plantations (mainly *Pinus radiata* and *Eucalyptus globulus*), which is 9% of the national total of 2 M hectares (Gavran and Parsons 2011).

3.3 CSIRO Team

The CSIRO team consisted of Philip Smethurst (Project Leader), John Raison, Sadanandan Nambiar and Bradley Moggridge, which covered all fields of expertise required and it specifically included the 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.

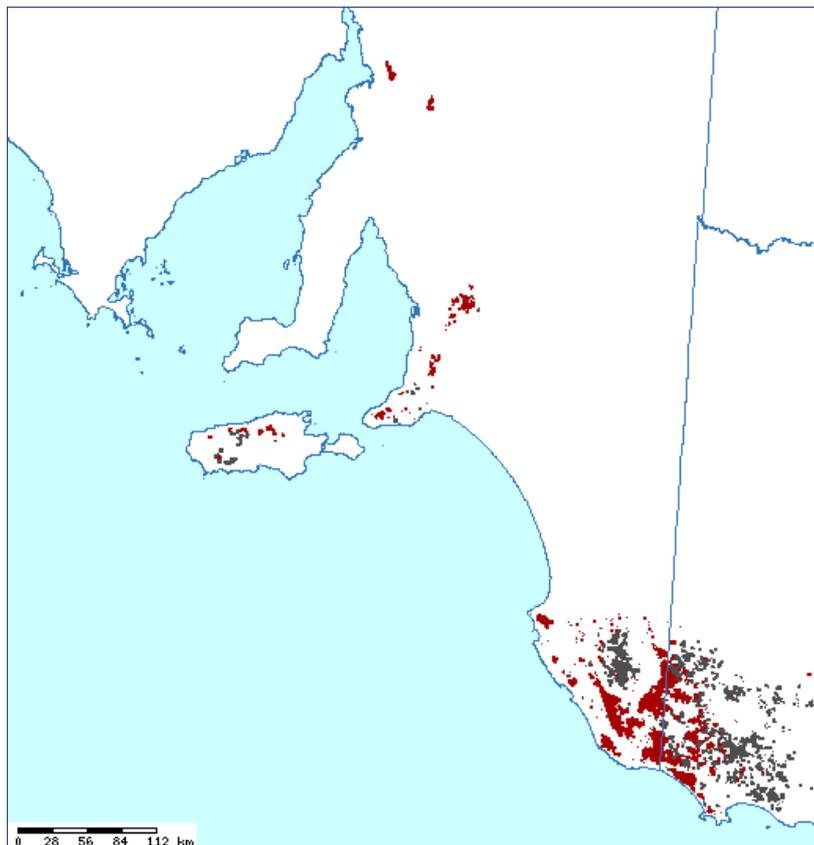


Figure 1. Map showing the location of plantations in South Australia and neighbouring areas in 2005 (from the Plantation Information Network website of the Australian Bureau of Agricultural and Resource Economics and Sciences <http://adl.brs.gov.au/mapserv/plant/index.phtml>). Hardwood plantations (mainly eucalypts) are shaded as grey, and softwoods (mainly pines) as red. Regional maps are available in Gavran and Parsons (2011).

3.4 Discussions and Field Visits

The team visited the south-east of the State for two days (Meetings and field visits, Appendix E). The Team Leader also discussed issues with other organisations (Appendix D).

4. INTRODUCTORY COMMENTS ON THE SOUTH AUSTRALIAN CODE

Plantation forestry in South Australia represents one of the oldest plantation development programs in Australia. The nucleus for that development was established in the south-east of the State about 130 years ago with *Pinus* species. Plantations in the State consist of *Pinus radiata* (radiata pine, 68%) and *Eucalyptus globulus* (Tasmanian blue gum, 32%); the latter were established mostly during the past decade. About 82% of the commercial plantations in the State are in the south-east (Mount Gambier region, i.e. South Australian part of the Green Triangle) and the remainder are located on the Mount Lofty Ranges, Kangaroo Island and Mid-North regions. There is a mixture of 45% public (ForestrySA) and 55% private ownership.

There are some special features of plantation forestry in the State that are relevant to codes of practice generally, and this assessment:

- The majority of forest plantations are grown on podzolised sands on flat terrain, and they are surrounded by agricultural land. The terrain, soil, and proximity to a range of processing facilities have supported the development of a relatively easily managed operational system for the pine plantations. Extensive areas of plantations are on second or third rotation sites, harvested on 25-35 years cycles. Over many decades, the pine industry has developed an integrated and intensive silvicultural regime to sustain and increase productivity.
- Most plantations in the south-east are underlain by limestone rock that contains aquifers. Hence, there are few surface water features. There are few water courses, however wetlands are major surface water features. Competition for access to water by various users, including plantation forestry, is a significant water policy issue in the south-east of the State.
- The Tasmanian blue gum estate has expanded rapidly in during the past decade with expected rotations of about 10-15 years for pulpwood production, and there has been less research and operational experience to guide sustainable management. There are concerns about the maintenance of productivity over multiple rotations, and about impacts of plantations on regional water use.
- The Adelaide Hills area has a more complex terrain with higher environmental risks. These plantations are mostly managed by ForestrySA, but the resource there is a very small contributor to wood supply in the State, as is the resource on Kangaroo Island.

The Code in South Australia comprises a set of guidelines that have been applied since 2009. This Code was developed from an earlier document ‘Environmental Guidelines for Plantation Forestry in South Australia’ (1997). The Code as such is not a legal or statutory document, but has been prepared to complement relevant Commonwealth and State legislation, standards, and other codes of practice and guidelines. Use of the Code is thus voluntary, but forest owners and managers are expected to comply with the Code, and we found that the majority of plantation growers do so.

The Code is set out in Chapters that specifically align with the National Principles (Appendix 1). Each Chapter contains the following content for each forest operation:

- Relevant Guiding Principles.
- Mandatory requirements specified in Commonwealth and State laws.
- Industry Practices – effectively a (best) practice that is expected to deliver good environmental outcomes, but this component is not fully endorsed by all plantation growers.
- Relevant References relating to the mandatory requirements or industry practices. Prescriptions to aid implementation of the Code are not provided, and there is no obligation to assess compliance or to monitor outcomes on the ground beyond what is required in related legislation.

The Code also has the following:

- appendixes that cover important region-specific issues relevant to the Green Triangle, Mount Lofty Ranges, Fleurieu Swamps, and Kangaroo Island, details related to land capability classifications, and buffer zones for forest operations.
- an electronic format, in addition to a printed format, with links to further information contained on websites.

The Code does not provide in-depth planning advice to forest managers. Anyone considering purchasing or developing a plantation needs to seek advice and consult with relevant government agencies or regional industry groups. Some practical guidance is available on the PIRSA Forestry website as factsheets and other reference material. Internal company manuals that guide plantation operations in the State are not generally available, but we were shown some sections of these (e.g. ForestrySA 2010).

It is expected that the Code is reviewed every 5 years to reflect industry and scientific developments or changes in stakeholder expectations. Regular but minor updates may occur to ensure current legislation, standards, codes of practice or guidelines are properly referenced.

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.
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a) Are the processes adequate to meet this criterion?

5.2 Existing Processes

Appendix 2 of the Code, and Plantations2020 (2007), provide a comprehensive summary of the legislation and other relevant documents that apply to plantation forestry in South Australia.

The legislation is divided into Commonwealth and State, and specifies the relevant agency, purpose of the legislation, and the most relevant sections of the legislation. Details include State regulations, codes of practice, policies, guidelines, planning documents, strategies, reports, and databases, and reference to further information. The following Acts are particularly important for plantation management.

Development Act 1993: This Act regulates all development, including plantation development in South Australia, through its authority on Development Plans for each local government. Planning Strategies to cover all areas of the State have been formulated to provide advice on State policy that affects Development Plans. The regulatory influence on forestry is that development approval is required for changes in land use. Commercial forestry and farming are defined as separate land uses in Development Regulations. Conversion of farming land to plantation forest is therefore a change in land use and approval with or without conditions is required from the local government. Appeals against approval conditions and actions to prosecute breaches of the Plan or conditions can be made in the Environment, Resources and Development Court.

Forestry Act 1950: This Act provides for on the establishment and management of forests by the Government in South Australia, but not on freehold land. It includes provisions for the creation and management of native forest reserves for the protection of native vegetation and for the management of roadside vegetation adjoining forest reserves for the purpose of fire prevention.

Aboriginal Heritage Act 1988: This Act sets enables the protection of Aboriginal heritage. All Aboriginal sites, objects and remains in South Australia that are of significance to Aboriginal tradition, archaeology, anthropology and history are protected. It also provides for the protection and conservation of all Aboriginal sites, objects and remains through a Register of Aboriginal Sites and Objects, and the establishment of an Aboriginal Heritage Committee to advise the Minister on the nomination of entries to the register and on management of sites listed on the register. All land owners are required to report any discovery of Aboriginal sites, objects or remains, and these must be evaluated for listing. If listed, the Minister can direct that particular measures are taken for protection or management, including the development of an Aboriginal Heritage Agreement.

Heritage Places Act 1993: This Act provides for the protection and preservation of non-Aboriginal heritage through a State Heritage Authority with functions that include administration of a State Heritage Register, negotiation of heritage agreements and provision of advice regarding heritage conservation. Provisional listing can be made on the heritage register, prior to evaluation. Items that may be of particular importance in respect to plantation management include:

- sites of geological or paleontological significance,
- places of rare, or endangered value that are of cultural significance, and
- places that might yield information contributing to an understanding of the State's history, including natural history.

Management arrangements for heritage sites can include the development of a Heritage Agreement with the site's owners. Other activities require approval and issue of a permit.

Fire and Emergency Services Act 2005: This Act provides for a Country Fire Service to assist with prevention, control and suppression of fires. Major plantation owners have their own fire fighting capacity (tankers and trained personnel). Each of these has the status of a brigade under the Country Fire Service, and is deployed under a joint command structure in the event of fire. Fire prevention responsibilities are also detailed under the Act. These involve fuel hazard reduction and fire break maintenance.

South Eastern Water Conservation and Drainage Act 1992: Provides for the conservation and management of water, and the prevention of flooding on rural land in the south-east of the State. A Drainage Board manages the drains and associated infrastructure.

Environment Protection Act, 1993: The Environment Protection Authority, created under this Act, aims to protect the environment having regard to the principles of “ecologically sustainable development”. The act covers activities causing pollution of soil, water and atmosphere. Water quality issues that require attention in relation to plantation forestry include potential pollution in regard to chemical use (fertilisers, herbicides) and the care and protection of stream beds and banks. Where polluting activities are identified, land owners may be directed to remedy the damage. Provision is made for development of Environment Protection Policies to cover specific industry or hazard situations.

Native Vegetation Act, 1991: This Act protects native vegetation in South Australia, and prevents clearing except where consent of a Native Vegetation Council is obtained. Consent for clearing can only be issued in limited defined circumstances. Broad scale clearing is not permitted. Removal of isolated trees is permitted in some cases provided there is a compensatory replanting of native species within a prescribed area.

Natural Resources Management Act, 2004: This Act provides to the sustainable and integrated protection and management of the State's natural resources. Natural Resources Management Boards operate in each region and these boards are responsible for water allocation planning and management. Responsibility for protecting water quality is covered by the *Environment Protection Act 1993*.

In South Australia, legislation governing land management practices is not specific to individual primary industry groups, which includes the plantation forestry sector, and auditing for compliance is done on a risk based approach that is determined by the government agency responsible for the legislation. The aim of the *Guidelines for Plantation Forestry in SA 2009* was to present an outcome focused document that summarised the legislated *Mandatory Requirements* along with identified forest industry best practices referenced as *Industry Practices*.

Generally, new plantation establishment on agricultural land is considered a change of land use, and requires a development application to be submitted to a local council. The replanting of an area that is already under plantation does not require development approval, but it must comply with any new legal requirements that have arisen since the previous establishment, and it should also consider adoption of good industry practices.

Development applications are assessed against relevant planning requirements, and in some cases advice or comment of relevant stakeholders can be sought. Planning authorities may also stipulate additional requirements on plantation design e.g. in relation to regulating impacts on

water (see Section 7). The Code encourages the use of good industry practice such as documenting plans, and developing internal monitoring and improvement programs.

There is no requirement to lodge a timber harvesting plan for approval, but there are obligations to comply with all mandatory requirements specified in the roading and harvesting Chapters of the Code.

5.3 Comments on Existing Processes

South Australia has in place a broad range of legislation to support the protection of environmental values during the establishment and management of new plantations. The Code provides clear instruction as to mandatory requirements, which provides the onus for individuals to comply. The Better Development Plan Project of the State government requires councils to convert existing Development Plans into a standard format that utilises a library of ‘modules’, including one on forestry. In addition a ‘Guide for applicants: Commercial Forestry (including farm forestry or agroforestry; <http://dataserver.planning.sa.gov.au/publications/740p.pdf>)’ is available and referenced in the Code. This project is aimed at reducing the current variation between councils in their requirements for development approvals. However, a need remains for local governments to share their resources and to improve the consistency of implementation of the Code. There is potential confusion for a manager of plantations on both sides of the border with Victoria as the two Codes have different contents and modes of application.

Roading and harvesting are major operations that can pose risks to the environment, and it would be desirable to have management of these risks specified in a timber harvesting plan that is approved before operations commence.

Compliance with the mandatory aspects of the Code is not monitored in a systematic way, so there is no certainty that the intent of the Code is being fully met. However, we were told by regulators and related government departments that there were no major concerns about adverse environmental outcomes in relation to plantation forestry.

For the main plantation developers (companies), the Code is only one instrument amongst many internal and external planning and auditing requirements, but the Code often forms the basis for meeting other requirements, e.g. voluntary forest management certification. The larger plantation companies mostly have forest management certification, and have strong internal planning and management systems. We studied some plantation development and harvesting plans and templates used by large companies. These plans were highly detailed in textual content and spatial information (maps), and showed strong emphasis on protection of environmental values.

Several stakeholders indicated a need for better landscape-level planning that included all main land-uses additional to plantations. Planning at this holistic level is important to guide local decisions that have implications beyond the boundaries of the forest estate, e.g. potential effects of large areas of a particular land use on regional hydrology that might have adverse effects on wetland ecosystems in the south-east of the State.

A large proportion of public complaints about plantation forestry, we were told, are about chemical use (especially herbicides), establishment effects on water supply, and visual impacts. Whilst there have been some past issues with chemicals affecting water quality in the Adelaide Hills, the EPA has not recorded any problems in recent years. An approach to dealing with the

effects of new plantations on water yield is now in place and is discussed in Section 7 of this report.

All complaints from the public are considered by local governments and operators, but few complaints are found to be due to poor Code content or implementation. Where a breach of the mandatory requirements in the Code is considered serious, restoration may be required and a penalty may be imposed as specified by an appropriate Act or Regulation.

5.4 Scope for Improvement

Preparation and approval of timber harvesting (and associated roading) plans before operations commence would improve confidence that environmental values are being protected. This may particularly be so for higher risk environments such as the Adelaide Hills.

In local government areas with long-established plantation activities, local government is informed of each timber harvesting plan. It would be useful if a similar approach was adopted where plantation harvesting is not yet common but likely to increase rapidly during the next few years, so that infrastructure can be prepared. We suggest the use of a rolling plan for harvesting during the subsequent 3-5 years, updated and discussed with local government every 1-2 years. This information would complement the regional wood transport model already developed by SERIC (www.seric.org.au).

Implementation of planning regulations and industry practices as outlined in the Code would be improved if local governments could up-grade their skills and processes to a common high standard. Even where a high standard is currently met, it would be more efficient for plantation development if there was much greater consistency of process across local governments. Adoption of a common proforma to be used for plantation development applications across the State would facilitate this, in addition to use of the 'Guide for applicants: Commercial Forestry' mentioned above. Further implementation of the Better Development Plan Project and other planning reforms underway should assist in meeting this need.

Enhanced regional planning, especially for water, with associated impacts on wetlands, would support better local decisions. Local government does not have the skills and resources required to undertake this type of planning, but there is a mandatory process for high risk areas already in place for local government to refer all proposed plantation developments to the relevant government department prior to approvals being granted. These processes are expected to be further developed with the release of water allocation plans in the South East and Mount Lofty Ranges, which are currently in draft form. This process is planned to be closely linked with plantation development approvals administered through local government.

5.5 Conclusion

South Australia has adequate legislation and planning processes in place to ensure protection of the environment during plantation establishment and management. Although the absence of a formal requirement for approval of harvesting plans poses some risks to environmental care, in locations where plantation activities have been conducted by large plantation companies for several decades already, existing processes ensure that there is a high level of planning performance and the implementation of plans. These processes need replicating in areas where plantation developments are relatively new. Where only small or agro-forestry activities occur, some local governments are under-skilled and under-resourced.

Suggested improvements are:

- Introduce a requirement for a regular (every 1-2 years) up-date and discussion with local government of a 3- to 5-year rolling harvesting schedule, and the provision of harvest plans with local government prior to harvesting.
- Consider developing, in the absence of 1-2 year auditing and reporting of Code outcomes, a mechanism for the approval of harvesting plans prior to the commencement of harvesting.
- Strengthen the skill base of local government, including the sharing of resources between jurisdictions, to enable more consistent adoption and implementation of planning regulations and industry practices as outlined in the Code.

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

South Australian (under several Acts including the *Native Vegetation Act 1991*, and the *National Parks and Wildlife Act 1972*) and Commonwealth legislation require that native plant and animal communities receive special management and protection if listed as rare, threatened or endangered. Plantation forest owners and managers must identify biodiversity assets both within the plantation area and surrounding it, and protect or manage them in accordance with relevant legislation. The Code also lists industry practices that are recommended to be followed to protect biodiversity e.g. minimum distance of 50 metres between a natural reserve and a plantation, buffering around retained native vegetation, guidance to regional plans and strategies for biodiversity conservation.

Native vegetation clearing is strictly controlled under the *Native Vegetation Act 1991*. Broad-scale clearing is not permitted and permits based on applications are required for removal of even individual native trees. Applications are evaluated by the Native Vegetation Council. Permits for native plant removal are issued for a very limited set of circumstances prescribed by this Act. Applications are assessed by officers of the Department of Environment and Natural Resources who provide support to the Council, and, where water values are likely to be impacted, applications are referred to the regional Natural Resource Management Boards. To compensate for any loss of environmental values caused by vegetation removal, it is necessary to establish additional native vegetation on another part of the property as an offset.

The Department of Environment and Natural Resources conducts annually a 'Biological Survey of South Australia' (http://www.environment.sa.gov.au/Knowledge_Bank/Information_and_data/Biological_Survey_of_South_Australia).

6.3 Comments on Existing Processes

Threats to biodiversity are likely to be greatest during the plantation establishment phase and are assessed by local government as part of applications required to establish a new plantation. Local government is guided by regional conservation priorities detailed in management plans available from Natural Resources Management Boards (e.g. SENRM 2010). Plantation development in South Australia is exclusively on land cleared previously for agriculture. The degree of access to experts, either on council staff or as consultants is likely to be variable across the State. However, advice can be sought from the Department of Environment and Natural Resources. Native vegetation within plantations is protected using detailed maps down to single trees.

Weed management is one area of concern. Two major problems are the spread of blackberry, and the invasion of pine wildlings into adjacent native forest. The latter problem seems to be getting worse due to the spread of seed by cockatoos, especially near the border in the south-east. ForestrySA has a program to control of wildlings in native forest reserves on their land.

There is no reported information on how well the Code is achieving the desired outcomes across the State. There was a comment from the Department of Environment and Natural Resources

that drawdown of ground water levels in wells outside the plantation estate was adversely affecting wetland communities, especially during very dry years that have occurred during the last decade. However, cause and effect were not clear due to a lack of detailed knowledge of the impacts of all uses of water (irrigation included) on regional hydrology. Major plantation forestry companies, which account for most of the plantation area, generally have good internal processes (also required for forest management certification) for the protection of natural plant, animal and landscape values, and in some cases they voluntarily implement practices that go beyond the minimum requirements of the Code.

6.4 Scope for Improvement

There is no systematic monitoring of the effectiveness of the Code in protecting biodiversity – whilst this will be a major task, it deserves further consideration, including assessment of the potential use of remote-sensing methods. In common with other criteria, there does not appear to be a research program targeted at improving the Code. Instead, there is an implicit assumption that research conducted and reported ad hoc between revisions of the Code will be adequate. Research on the extent, rate of change, and mitigation options for dealing with the invasion of pine wildlings would be useful.

6.5 Conclusion

The Code content and processes of implementation are adequate for protecting animal and plant communities, and we were told that there were no serious breaches of this aspect of the Code. A suggestion for improvement is that:

- a transparent process for assessing outcomes resulting from application of the Code (including audit reports) and for the incorporation of these and the results of independent research into future revisions of the Code.

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

The Code states that it is mandatory for the landowner to take reasonable measures to prevent or minimise harm to water courses, wetlands or lakes within the plantation or adjacent to it. This includes physical damage to the bed or banks of water features, as well as the ecosystems that depend upon them. The Code stipulates the need to comply with specific regulations contained in a number of Acts and it lists a number of suggested or recommended broad industry practices that aim to limit impacts of forestry on water resources. For specific guidance plantation managers are referred to regional Natural Resource Management Boards and their Natural Resource Management or Water Allocation Plans. Appendix 6 defines buffer and filter zones for plantation operations and it specifies some metrics for these. Chapter 6.5 of the Code specifies approaches to the safe use of chemicals, including ways to minimise risks of water pollution. Chapters 8 (Roading) and 9 (Harvesting) of the Code specify a range of broad actions that aim to protect water resources.

Appendix 6 also mentions the need to undertake risk assessments as a basis for modifying the metrics for buffer and filter zones and other management practices. We recognise that large plantation companies have internal planning processes, additional to those specified in the Code, to deal with activities that might affect water quality, especially road construction, harvesting operations, and the use of chemicals. Water features are identified on maps, along with machinery exclusion zones (i.e. buffers) and other areas of restricted or modified activities.

Water availability for diverse needs is a major issue in the south-east of the State because of historical over-allocation in some areas, and concerns about the potential impacts of an expanding plantation estate. These issues may become more complex under a possible future drying climate. Forestry is the only non-irrigated land use so far examined in terms of impacts on water use. Water use by new plantations has been regulated since 2004, with the impacts on water being assessed during the approval process. A change of land use triggers this consideration and requires a water licence for the project area. In some locations there is a 'reserve' of land that can be used for new plantations, and about 36,000 hectares of the total reserve of 59,000 hectares for the region have been planted since 2004. Since 2007, direct extraction from ground water has been regulated where a water table is within 6 metres of the ground surface. Natural Resource Management (NRM) Boards may also address the impacts of existing processes on water resources, and in areas of over-allocation, forestry along with all other major water users will be expected to contribute to reductions in water use. The issues are contentious, with concerns about the lack of transparency of the science that underpins decisions and inequities across land uses.

Water allocation plans that include existing plantations have been under development since 2007, but due to its contentiousness, related legislation is yet to be passed by the South Australian parliament. For the time being, the appropriate NRM Board provides guidance on water allocation issues for plantation forestry. Future water allocation plans propose to take account of the consequences of the location of new plantations, as well as the effects on wetland ecosystems. Farm forestry is exempt from the regulations.

Auditing for water values is carried out by government agencies using a risk-based approach in accordance with their regulatory responsibilities (EPA – water quality, Department for Water – water quantity, DENR – biodiversity). This information informs the development of state and regional water management policy. Local Government has no role in regulating water values.

7.3 Comments on Existing Processes

Appendix 6 of the Code stipulates the need to undertake risk assessments (e.g. to decide whether it is acceptable to harvest existing trees from buffer zones, whether to plant and harvest trees in drainage lines, whether to increase the width of filter or buffer zones. However, in the absence of any guidance either in the code or in associated documents, decisions could be arbitrary. Whilst Appendix 5 of the Code describes broad methods for land capability assessment, this process is not easily translated to site-level management decisions by foresters, and the Code does not make any attempt to link Appendices 5 and 6.

In general, water quality problems in agricultural landscapes are more serious than those in forested landscapes including forest plantations, and the inclusion of plantations in agricultural landscapes can lead to improvements in water quality (e.g. Smethurst and Neary 2010, Smethurst and Petrone 2010). This option is not discussed in the Code.

7.4 Scope for Improvement

Consideration should be given to including either in the Code, or in supporting documentation, more specific guidance for site-level risk assessment, and prescriptions for the application of filter and buffer zones (currently applicable mainly to wetlands), as is done in some other Australian Codes of practice for plantations.

Expanded research on the effects of plantations on regional water resources in the south-east region would be invaluable in refining plantation policy and practice in relation to assessment to and management of water resources. Enhanced processes could then be developed for assessing the risks imposed by plantations to regional hydrology and wetlands. Maps indicating locations of greatest risk would assist local planners.

7.5 Conclusion

Our assessment is that the Code content and processes of implementation are generally adequate for protecting water values. Relatively flat terrain, permeable soils and moderate rainfall intensities help to minimise the risks to water quality over much of the plantation estate.

Suggestions for improvement are:

- Provide better linkages between the broad goals stated in the Code and management guidelines in supporting documents available to all growers.
- Prescriptions for protecting water values that are varied according to risk need to be either in the Code or provided in supporting documentation.
- A lack of auditing of Code outcomes leads to uncertainty about whether water values are being consistently protected. Statewide processes for capturing and disseminating field experience, audit outcomes, and other new information, in a

timely manner are needed to assist plantation managers and other stakeholders in up-dating knowledge and management guidelines.

- There is heavy dependence in the Code on water allocation regulations external to the Code, and these are likely to change in the near-term. The Code will require updating its reference to new regulatory arrangements..

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 importance of soil protection is stressed in several chapters of the Code, especially in Chapter 6 Establishment and Maintenance, where actions to minimise erosion and the desirability of organic matter (logging slash) retention are covered, and Chapter 8 (Roading), where the importance of minimising soil disturbance, soil compaction, and run-off leading to soil erosion are emphasized. Important risk factors such as slope, erodibility, and disturbance are discussed. The plantation forestry Land Capability Classification System described in Appendix 5 uses soil erosion as the principal limiting factor.

In the Code, it is suggested that harvesting and haulage activities should cease when the soil is saturated, or when water is running in extraction wheel tracks.

8.3 Comments on Existing Processes

The Code provides very little specific guidance as to how to achieve soil protection goals. For example, it recommends that ‘tolerable levels’ of soil damage be determined, that steps should be taken to ensure water is not concentrated down wheel ruts, and that there should be progressive rehabilitation of tracks, roads, landings and earth works associated with harvesting operations. These statements are essentially ‘awareness-raising’, rather than providing practical guidance.

Risk assessments for soils, and using such information to modify plans or plantations operations is a complex process. Larger companies have internal expertise to achieve this or they can access external assistance. Smaller growers are less able to deal with soil protection issues, and,

because there is no obligation to comply with non-mandatory components of the Code, and no systematic monitoring of performance on the ground, soil damage may occur and not be detected. The environmental section of the ForestrySA Plantation Forestry Manual (ForestrySA 2010) provides more detailed guidance for water protection from chemicals (buffers widths and setback distances for different types of spraying operations), but this document is limited to internal circulation within ForestrySA. There would be more confidence in the protection of soils if the Code included links to specific practical guidance for soil protection.

There is a lack of recognition amongst some short-rotation eucalypt plantation growers of the environmental and productivity risks associated with whole tree harvesting and slash removal systems (burning, windrowing, or removal as feedstock for bioenergy) that include organic matter and nutrient-rich materials (foliage, twigs and bark) when these plantations are harvested, despite the Code stressing slash retention as ‘best practice’.

8.4 Scope for Improvement

More practical guidance on soil protection issues would be valuable for small-scale forest growers and local government. This could be achieved by sharing of regional expertise between all those requiring access to it.

A more complete explanation of the management of risks associated with harvesting and slash removal systems is required in the Code or associated documents. The radiata pine sector has already developed and implemented high quality management to avoid this risk; similar systems should be adapted to eucalypt plantations.

8.5 Conclusion

The Code presents a set of statements about the desirability of protecting soil values, and some qualitative description of actions to achieve that goal. Large companies and ForestrySA have more detailed operating procedures to achieve this.

Suggestions for improvement are:

- Provide better guidance to achieve consistent assessment of risks to soil values, and a system to broadly assess outcomes on the ground,
- Improve access to soils expertise for local government and small growers, and
- Improve guidance on harvesting practices and slash and litter management for eucalypt plantation forestry to be in line with the practices widely adopted by the pine sector in the State.

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
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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

Heritage values are managed in South Australia under the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, the South Australian *Aboriginal Heritage Act 1988* and *Heritage Places Act 1993*. The Code indicates that cultural heritage values should be protected and directs Code users to these Acts. Industry practice is indicated as:

- Identify cultural and heritage values, and protect and enhance where possible, in consultation with stakeholders and with reference to relevant documents.
- Notify the appropriate department about significant Aboriginal sites, or if any items are found during the course of development.

Identification of heritage places is assisted by provision of the South Australian Heritage Places Database (<http://www.planning.sa.gov.au/go/heritagesearch>), which is online, searchable, and includes Aboriginal and non-Aboriginal sites and places containing natural heritage. The latter can include flora or fauna populations and geological formations.

The *Aboriginal Heritage Act 1988* provides for automatic protection upon discovery, and for assessment by experts before its significance for listing is established. Necessary protection levels can be determined by the SA Aboriginal Advisory Council and be negotiated or made mandatory for site owners and managers. The Aboriginal Affairs and Reconciliation Division, Department of the Premier and Cabinet, has produced guidelines for individuals and organisations who propose to undertake activities that could impact Aboriginal sites, objects, remains or traditions protected by the Act. These guidelines help people to understand how to comply with the Act.

9.3 Comments on Existing Processes

Under the *Aboriginal Heritage Act 1988*, in the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery to the Minister, but this need is not included in the mandatory section of the Code.

An analysis of legislation and regulations applying to plantation developments in South Australia did not identify any concerns about cultural heritage (Plantations2020, 2007). Also, there are currently few heritage listings involving areas used for plantation forestry. A lack of cultural heritage issues in relation to plantation forestry in South Australia probably reflects that plantation forests in South Australia are predominantly established on land previously cleared for agriculture or on second- or third-rotation sites that have already had many decades of disturbance. Few new cultural heritage discoveries are made and these types of sites therefore no longer pose a significant threat to heritage values. However it was identified that little guidance or training is provided to plantation staff on how to identify cultural heritage objects and places and the process to report the new discovery, which could also be related to the low discovery rate.

The SA Aboriginal Affairs and Reconciliation Division advised they are preparing with Green Triangle Forestry Products a guide to assist the company in informing new and current staff of the types of cultural sites they may come across in the landscape during forest related activities, and informing them also of their obligations under the legislation. The guide was expected to be available by the end of 2011. This type of response is positive for the ongoing protection of cultural heritage and it is consistent with meeting the related National Principles.

9.4 Scope for Improvement

Users of the Code should be given more guidance on how to meet their cultural heritage obligations:

- The Code should, as a guide to compliance, more prominently direct plantation managers and operators to the Aboriginal Affairs and Reconciliation Division overview of the *Aboriginal Heritage Act 1988*.
- The Code currently does not advise that, prior to preparing a forest management plan, a proponent should engage with Traditional Owners to ensure that any Aboriginal heritage site or place is provided due protection. Protection is provided by the Act only if the site registered on the following database.
- Indicate which databases are to be searched, e.g. South Australian Heritage Places Database, and when experts should be consulted during the development of plantation proposals.
- Ensure that within the Code there is an acknowledgement of guidance given where cultural heritage maybe affected, such as during the planning, construction and maintenance of roads.
- Indicate who should be informed and when operations must cease in the field if a cultural heritage object or place is discovered during operations.

9.5 Conclusion

Existing Code content and implementation processes for the protection of cultural heritage could be improved by providing more specific guidance and training on how to locate and identify potential cultural heritage sites, and on obligations under the relevant legislation during operations if a suspected artefact or place is discovered. It is also desirable to encourage the engagement of local Traditional Owners during the preparation of plantation strategic planning at a regional level.

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 pest and diseases?

10.2 Existing Processes

Major plantation owners in South Australia devote considerable effort to protecting plantations and adjacent properties from fire due to their value and the high bushfire risks in the region. They have worked together to develop and implement fire prevention and management plans. Major owners have their own fire brigade units which are coordinated by the SA Country Fire Service. The plantation owners in SA meet as a regional bushfire council to prepare for and test cooperative arrangements. These include the development and adoption of common plantation design guidelines covering fire break design, implementation and maintenance. Due to the proximity of large plantations areas on the border with Victoria, there are cross border arrangements through a regional fire council to ensure effective cooperation in the event of major fire outbreaks.

The level of protection from fire given to remnant vegetation within the plantation area is identical to that for the plantation. Firebreaks are used to separate the forest types. Controlled burns (aimed at reducing fuel levels and thus fire risk) within native vegetation are not common and if desired require approval from the Native Vegetation Council. Exemptions under the *Native Vegetation Act 1991* may be sought for the purpose of establishing fire breaks or for fire control.

There are some well-known pest and disease risks to plantations in SA but they remain largely under control through management. Monitoring and control arrangements common across organisations are in place for the management of the insect pests *Sirex*, *Ips* and *Essegella*. Control of these insects is primarily by biological measures and by thinning to minimise water stress in remaining trees. Fungal pests of *P. radiata* are rare, and do not currently pose a threat to other species. Landowners in SA are required to control declared animals and plants using lawful methods. If the introduction of an exotic pest in a forest plantation is suspected, it must be reported immediately to PIRSA Plant Health and Quarantine. Native fauna that can damage young (mainly) plantations may be controlled via a 'Permit to Destroy Wildlife' issued by the Department of Environment and Natural Resources. Where pest or disease causes significant damage to plantations, landowners are encouraged to report this to PIRSA.

10.3 Comments on Existing Processes

Under some extreme fire and weather circumstances, it is recognised that fires cannot be controlled. However, strong and co-ordinated efforts are made to minimise losses due to fire. Some weeds and pests also cannot be completely controlled or eliminated from plantations due to technical limitations and cost.

There seems to be an increasing invasion of ‘pine wildling’ into some areas of native vegetation. Control measures include prescribed burning of native vegetation, and in some cases pine removal by volunteers. There may however be a need to more systematically deal with the problem.

10.4 Scope for Improvement

While efforts within the plantation area generally occur on an on-going basis, with an emphasis on perimeters of the plantation, greater emphasis is needed on adjacent lands to reduce the invasion of pine wildlings into areas of native vegetation.

10.5 Conclusion

Plantation managers work well together and in co-operation with the Country Fire Service to help mitigate fire risk to the plantation estate and adjacent assets and communities. Existing Code content and implementation processes focus on protection against fire, weeds, and other pests within plantations, but there is incomplete control and protection from weeds in some cases. More effort is needed to control pine wildlings in some parts of the State, e.g. in native forests in the south-east near the Victorian border.

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 deals briefly with safety and training in Chapter 10. The focus is on personal safety. Environmental care training is currently provided through “on the job” training of contractors by their supervisors.

Larger companies and ForestrySA employ trained foresters who are aware of the principles of environmental care, and for those organizations that have voluntary forest management certification (FSC, AFS, or both) there are processes in place to ensure that contractors have the capacity to deliver good environmental performance.

Training in relation to chemical handling and use, for both operators and supervisors, is required and is summarized under ‘mandatory requirements’ in Chapter 6.5 of the Code.

11.3 Comments on Existing Processes

To maintain environmental performance, the need to train managers or contractors in the principles of environmental care warrants attention. There are no requirements for formal operator training in relation to environmental care principles and training opportunities seem limited.

Large plantation companies have internal requirements (including forest management certification) that ensure adequate training at various levels. However, local government and small growers may in some cases have inadequate expertise or resources.

11.4 Scope for Improvement

Environmental management is complex, including understanding and implementing the Mandatory and Industry Practice components of the Code. Managers and supervisors are often trained to some extent in these aspects, but Code effectiveness is likely to be enhanced if all practitioners have at least a basic understanding of environmental management, even down to machine operators and other contractors. Hence, efforts to up-skill and coordinate practitioners warrant more investment and the establishment of systematic training programs.

11.5 Conclusion

Training needs of field supervisors and operators in environmental management should be more specifically addressed in the Code, so that the overall performance of all staff in the sector is at a high standard.

12. OTHER NATIONAL PRINCIPLES

Apart from the 10 National Principles addressed in detail so far in this report, there are a further 23 National Principles (NPs). However, most of these overlap extensively with those of Environmental Care dealt with above. In the section below, each of these additional Principles is listed, and a '*Comment*' added if it has not been adequately addressed already.

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 which also exists under federal and State worker safety legislation. Large plantation companies seem to go beyond the minimum requirements, but we did not explore to what extent small growers and agro-forestry operators provide safe working conditions.

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: Local government planning schemes permit plantations as a land use but the establishment of plantations usually requires consent as a changed land use. The Forest Property (Carbon Rights) Amendment Act 2006 amended the Forest Property Act 2000 to provide for the separation of ownership of land, forest vegetation and carbon rights, and includes rights to harvest.

The Code recognises the general contribution that plantation forestry can make to social and economic values, and it emphasises the need for economic plantation operations, but no economic guidance is provided, and the only social value considered in detail is cultural heritage. Forest owners and investors are encouraged to establish forest plantations that produce timber or non-timber products that optimise commercial viability and long-term social and economic benefits. Environmental effects of plantations are considered earlier in this assessment (sections 5-10 of this assessment report).

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: Without specifically mentioning roads, these NPs have been implicitly addressed earlier in this report. Roads are recognized in the Code as a major potential environmental risk, and they are dealt with in Chapter 8 of the Code. In relation to road planning external to the plantation, i.e. those roads provided by local government, some local governments reported that they expect to be given more advanced notice of future harvesting intent. A longer-term, strategic time-frame would be advantageous to facilitate road planning. Road construction and

maintenance within the plantation area can also create pressure on roads provided by local government, because road materials and equipment need to be transported to and from the property. Mostly, these concerns are not environmental, but they could become so in some instances where drainage problems arise that lead to increased sediment delivery to streams. Increased pressure on rural roads, especially from large vehicles can also have implications for community safety.

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 and it is therefore assumed plantation managers will make only sound economic and species-site decisions. Recent developments in the managed investment scheme sector of the plantation industry in South Australia (and some other States) brings into question the attainment of Principle 5.1 in those cases, but it was beyond the scope of our assessment to analyse this situation in detail. Other aspects of these Principles 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.

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: Auditing for compliance is done on a risk based approach that is determined by the government agency responsible for the legislation. Some companies and local government bodies also have systems of monitoring and auditing that are independent and comprehensive, but there is no consistent or coordinated State-wide system in place. Effective protocols deployed in some regions by some of the companies could be extended to other regions, and a system developed for the systematic capture and feedback of this information to the authors of the Code, and others. A regular (e.g. 1-2 years) compliance report would be a useful way to inform key stakeholders about the level of compliance with the Code.

With an expectation of revision, 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

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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.

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.

5. 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.

6. 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.

7. 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.

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

AFS	Australian Forestry Standard
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EPA	Environment Protection Authority
FIDB	Forest Industry Development Board
ForestrySA	Trading name for South Australian Forestry Corporation
FSC	Forest Stewardship Council
GTFP	Green Triangle Forest Products
NP	National Principle
NRM	Natural Resource Management
PIRSA	Primary Industries and Resources South Australia
SA	South Australia
SENRM	South East Natural Resource Management Board

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 30 June 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 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
Department of Environment and Natural Resources
Department of Water
Elders Forestry
Environment Protection Authority
ForestrySA
District Council of Grant
Green Triangle Forest Products
Gunns Limited
Naracoorte Lucindale Council
Plantation Timbers
South East Natural Resources Management Board
Wattle Range Council

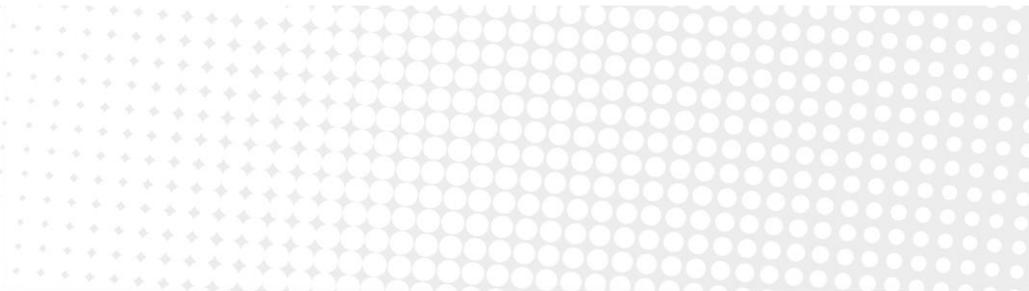
APPENDIX E – MEETINGS AND FIELD VISITS

Tues 8th February 2011

Meeting with industry, local government, and State government stakeholders
Pine plantation establishment and harvesting (GTFP)

Wed 9 February 2011

Eucalypt establishment and harvesting (Elders Forestry, ForestrySA)



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CSIRO and the Flagships program

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