



Assessment of Code of Practice for Plantation Forestry: New South Wales

Philip J. Smethurst, E.K. Sadanandan Nambiar, R. John Raison, and Bradley Moggridge

Prepared for Australian Government Department of Agriculture, Fisheries and Forestry

May 2012

Cover Photo: A landscape mosaic of native forest and *Pinus radiata* plantation near Tumut, NSW. Patches of native trees or individuals were retained as the plantation was developed. Streamside buffers were kept plantation-free. Contour cultivation was used as a protection measure against soil erosion and to promote tree growth.

Enquiries should be addressed to:

Assistant Secretary
Forestry Branch
Climate Change Division
Australian Government Department of Agriculture, Fisheries and Forestry
GPO Box 858
CANBERRA ACT 2601
Email: forestry.contact@daff.gov.au

Distribution List

Assistant Secretary	3 hard copies and
Forestry Branch	electronic copy
Climate Change Division	
Australian Government Department of Agriculture, Fisheries and Forestry	

Copyright and Disclaimer

© Commonwealth of Australia 2012. To the extent permitted by law, all rights are reserved and no part of this publication covered by copyright may be reproduced or copied in any form or by any means except with the written permission of the Commonwealth of Australia.

Important Disclaimer

CSIRO advises that the information contained in this publication comprises general statements based on documents provided for this assessment and discussions with relevant persons. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

Contents

1.	Summary	5
2.	Background	5
3.	Method of Assessment	6
3.1	General Approach.....	6
3.2	Approach in New South Wales	7
3.3	CSIRO Team	8
3.4	Discussions and Field Visits	8
4.	Introductory Comments on the New South Wales Code	8
5.	Criterion 1: Compliance of plantation management with relevant planning schemes and legislation	10
5.1	Relevant National Principles and Questions	10
5.2	Existing Processes	10
5.3	Comments on Existing Processes.....	11
5.4	Scope for Improvement	12
5.5	Conclusion	12
6.	Criterion 2: Protection of native vegetation and animal communities and natural landscape values	12
6.1	Relevant National Principles and Questions	12
6.2	Existing Processes	13
6.3	Comments on Existing Processes.....	14
6.4	Scope for Improvement	14
6.5	Conclusion	14
7.	Criterion 3: Protection of water quality and, where required, management of water yield	14
7.1	Relevant National Principles and Questions	14
7.2	Existing Processes	15
7.3	Comments on Existing Processes.....	15
7.4	Scope for Improvement	16
7.5	Conclusion	16
8.	Criterion 4: Protection of soil resources	16
8.1	Relevant National Principles and Questions	16
8.2	Existing Processes	16
8.3	Comments on Existing Processes.....	17
8.4	Scope for Improvement	17
8.5	Conclusion	17
9.	Criterion 5: Protection of cultural heritage values	17

9.1	Relevant National Principles and Questions.....	17
9.2	Existing Processes.....	18
9.3	Comments on Existing Processes	18
9.4	Scope for Improvement.....	19
9.5	Conclusion	19
10.	Criterion 6: Protection from fire, pests and diseases	19
10.1	Relevant National Principles and Questions.....	19
10.2	Existing Processes.....	19
10.3	Comments on Existing Processes	20
10.4	Scope for Improvement.....	20
10.5	Conclusion	21
11.	Criterion 7: Training for environmental care	21
11.1	Relevant National Principles and Questions.....	21
11.2	Existing Processes.....	21
11.3	Comments on Existing Processes	21
11.4	Scope for Improvement.....	21
11.5	Conclusion	22
12.	Other National Principles.....	22
12.1	NP2. SAFETY	22
12.2	NP3. PLANNING.....	22
12.3	NP4. ACCESS	23
12.4	NP5. ESTABLISHMENT AND MAINTENANCE	23
12.5	NP6. TIMBER HARVESTING	24
12.6	NP7. FOREST PROTECTION.....	24
12.7	NP8. MONITORING AND REVIEW	25
13.	Acknowledgements.....	26
14.	References.....	26
	Appendix A – National Principles.....	28
	Appendix B – Acronyms	32
	Appendix C – Terms of reference for CSIRO.....	32
	Appendix D – Organisations consulted	33
	Appendix E – Meetings and field visits.....	33

1. SUMMARY

The New South Wales (NSW) Plantation and Reafforestation (Code) Amendment Regulation 2010 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 plantation forest management system in NSW is facilitated by a sound code that is reviewed every five years, and a single point of contact for developing plantation proposals and operational plans, and for conducting audits. There is also cooperation between large plantation companies and the State government during the planning and auditing phases. In addition, most companies have forest management certification to meet international standards of environmental care, and are supported by internal company systems and expertise aimed at achieving positive environmental outcomes. During our assessment we found a positive and participatory attitude towards the Code and related guidance and implementation mechanisms, by all stakeholders including State government, large plantation companies and small growers. We are not aware of any major environmental degradation that has resulted from plantation forestry activities. Based on these observations, we conclude that the Code and its implementation in NSW are satisfactory for achieving the national principles of environmental care.

We have identified some areas for improvement:

- Several aspects of the National Principles are not considered by the Code as they are regulated by other areas of legislation, e.g. weeds and other pests and diseases, water quality, worker safety, rubbish, and chemical use. These aspects should be cross-referenced in the Code and audited so as to provide a more complete system.
- Summaries of Code audit reports are not readily available. An annual summary of audit observations and outcomes should be readily available, including penalties and corrective actions, which would improve transparency of the system.
- An on-going concern about environmental outcomes associated with plantation activities is weed management. Eradication of several serious weeds such as blackberry is not possible and this situation is aggravated by the invasion of weeds in stream buffers. There is a need to improve buffer management in relation to weeds, fire and grazing while retaining their primary function in soil and water protection.
- The potential risks to productivity caused by the removal or utilisation of harvesting slash needs to be recognised in the Code, along with reference to guidance on slash management options.
- There is a risk that new specifications for fire roads might actually lead to the unforeseen outcome of less fire protection, but the actual impact needs to be assessed after a period of implementation.

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.

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

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 (NSW 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 NSW 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 New South Wales

Our work was facilitated by the Plantation Assessment Unit (PAU), Primary Industries, Department of Trade and Investment, Regional Infrastructure and Services, which is responsible for developing and implementing the Code. We gathered information during two visits to NSW, during which we consulted widely (Organisations consulted, Appendix D). Key documents reviewed include:

- *Plantations and Reafforestation Act 1999*
- *Plantations and Reafforestation Amendment Bill (2010)* effective 1st January 2011
- Plantation and Reafforestation (Code) Regulation 2001
- Plantation and Reafforestation (Code) Amendment Regulation 2010 effective 1st January 2011
- Changes to the Plantations Act and Code: Summary (Industry and Investment NSW 2011a)
- Forest Practices Code – Part 1 Timber Harvesting in Forest NSW Plantations (Forests NSW 2005)
- Aboriginal Objects Due Diligence Code (Environment Climate Change & Water NSW 2010)
- Best Management Practices for retained areas in forestry plantations (Baker et al. 2009)

- Documents submitted for plantation development approval. These included, maps of the proposed areas (total and plantable), soil and terrain information, water, and areas protected for bio-diversity and heritage values.
- Internal audit reports of performance provided by some plantation companies
- Plantation management guidelines used by major plantation growers
- Plantation management plans and maps

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

A map showing the distribution of plantations in NSW is provided in Fig. 1. In 2010, NSW had about 0.39 M hectares of plantations (mainly *Pinus* and *Eucalyptus* species), which is 19.5% of the national total of 2 M hectares (Gavran and Parsons 2011). All commercial plantations are within approximately 200 kilometers of the coast. Plantations in the central and southern half of the State are predominantly *Pinus radiata* that are in their 1st, 2nd or 3rd rotation and managed for a variety of products that are produced in the region, e.g. sawn timber, veneers, particle board, treated timber, pulp, and paper. Plantations in the northern half of the State are predominantly sub-tropical and tropical *Eucalyptus* species in the early phase of the first rotation. These northern plantations were intended for veneers, sawn and other structural timber, and pulpwood.

3.3 CSIRO Team

The CSIRO team consisted of Philip Smethurst (Project Leader), John Raison, Sadanandan Nambiar, and Bradley Moggridge, which covered the fields of expertise required and it specifically included sustainable plantation management, soils, nutrition, hydrology, biodiversity, conservation, and cultural heritage. All team members participated in field visits.

3.4 Discussions and Field Visits

The team visited NSW twice during the assessment, for a total of five days (Meetings and field visits, Appendix E). During these visits and follow-up contacts with key stakeholders (Appendix D) we gathered the required information.

4. INTRODUCTORY COMMENTS ON THE NEW SOUTH WALES CODE

In NSW, the plantation industry is regulated by the *Plantations and Reafforestation Act 1999* and the *Plantation and Reafforestation (Code) Regulation 2001*, including their amendments, i.e. the *Plantations and Reafforestation Amendment Bill (2010)* and the *Plantation and Reafforestation (Code) Amendment Regulation 2010* (hereafter referred to as the Code). The *Plantation and Reafforestation Act 1999* provides for a single authority for plantation approvals across the State, which is currently The Plantation Assessment Unit (PAU), Primary Industries,

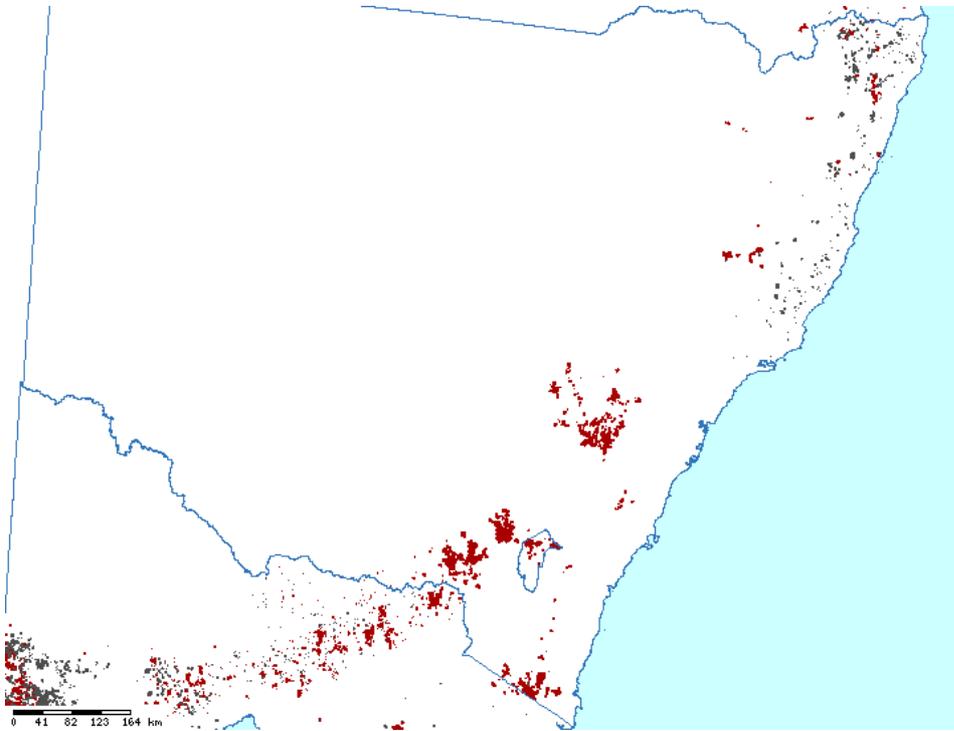


Figure 1. Map showing the location of plantations in NSW and neighbouring areas in 2005 (from the Plantation Information Network website of the Australian Bureau of Agricultural and Resource Economics and Sciences <http://adl.brs.gov.au/mapserv/plant/index.phtml>). Hardwood plantations (mainly eucalypts)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

of the Department of Trade and Investment, Regional Infrastructure and Services. The Code sets out the authorisation process, contains standards and provisions for environmental protection during plantation establishment, harvesting and other management operations. The Code also describes the provisions for dealing with potential offences, notices and penalties. The act and the Code first came into force in 2001. A revision process for the Code commenced in 2005 and ensuing amendments were ratified in 2011.

The PAU is responsible for implementing the Code and for managing a 5-yearly revision process. The Code addresses plantations on both public and private land. Some major plantation growers are certified to the forest management standards of either or both the Forest Stewardship Council and The Australian Forestry Standard.

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 Code provides an overarching framework and linkages to most other legislative requirements in NSW related to plantation development, so that meeting Code requirements would largely ensure compliance with relevant legislation. Baker et al. (2009) lists a framework of Commonwealth, State and local government legislation under which plantation forestry in NSW operates. This list is an up-date of that provided by Plantations2020 (2007).

The PAU has developed systematic and widely communicated protocols for assisting plantation activities in the State. A proponent planning to establish a plantation needs to contact the PAU for assistance with pre-application steps. A plantation development is exempt from requiring approval if the plan is to establish a plantation where the total area of plantations on a property will not exceed 30 hectares in area, but many such proponents still seek approval because it ensures a right to harvest. If approval is required or desired, the PAU provides information to assist in the preparation of an application for authorisation. This information is drawn from (1) data bases and maps of planning requirements and environmental values, including cultural heritage, native vegetation, soil, and water, (2) operational guidelines, and (3) a site inspection by an officer of the PAU to review the site attributes relevant to environmental values, e.g. soil type, heritage, native vegetation, streams etc. and to refine the proposed plan. Large proposals can take several days of field work. An application is typically processed within 14 days if it complies with the Code. Non-complying applications take up to 40 days to process, because additional verifications are required for all key values and special operational measures might be required to avoid significant environmental impacts. If significant impacts cannot be avoided, the application is rejected, and the applicant can appeal to the Land and Environment Court within 28 days.

We were informed that, in the pine growing regions, all applications for plantation development had been approved. The pre-application steps had resulted in many applications being modified to ensure compliance with the regulations, and in some cases applicants had discontinued with the application phase.

Once approved, a plantation manager can establish and/or continue to manage the plantation in accordance with the Code and conditions of the approval. Officers of the PAU also assist with the preparation of operational plans that are required prior to commencement of activities including site preparation, road and drainage construction, and harvesting. Harvesting plans

should be lodged at least 7 days in advance of the operation. Activities in authorised plantations are monitored from time to time by PAU officers to verify implementation, and compliance.

Plantations are authorised as either complying with the Code, or as non-complying with one or more provisions of the Code. Only a very small proportion of plantations are approved as non-complying. Authorised non-complying plantations include measures to achieve adequate environmental protection, and the approval process includes a period for comment by adjoining neighbours and the relevant local government authority. Any submissions received are considered in the assessment process, in conjunction with any additional information that may be requested to be supplied by the applicant to allow determination of the level of environmental harm that may result due to the non-complying aspect, and any conditions that may be imposed to minimise such impact. Submissions can only address the relevant non-complying aspect of the application.

Plantation management activities that involve the felling of up to 100 trees per hectare per year do not require a harvesting plan, but specific records of the activity must be kept.

Local government's main interest in plantation forestry is focused on potential impacts on roads. To ensure local government is informed of likely plantation activities, they are notified of each plantation development via a copy of the approval. In some regions of the State, timber haulage plans exist and are up-dated periodically, but this process is not as thorough in some other regions of the State.

Not all aspects of the National Principles are covered in the Code, e.g. management of weeds and other pests and diseases, water quality, worker safety, disposal of rubbish, and use of chemicals, but plantation managers have obligations to address them appropriately under separate legislation.

5.3 Comments on Existing Processes

We visited field sites to observe the implementation of these processes, and we found that they were implemented properly, taking into consideration all legislation and planning requirements, and planning for the protection of environmental values.

Two aspects in relation to planning roads were raised as strong concerns due to the impracticality of some Code provisions. We did not examine those concerns but we report them here as areas for review. Firstly, it was reported to us in discussions that the recently introduced rules about the designation of roads as suitable for particular classes of fire vehicles (Industry and Investment NSW 2011b) is poorly conceived and highly subjective. It was also reported that the specifications for signage were not well-considered, costly and impractical. It was pointed out that these rules might lead to unforeseen outcomes such as road closures or down-grades that will lead to more restricted access and reduced fire protection. Application of geographical positioning system technology and sound radio contact networks were thought to be potentially safer, more effective and practical means of dealing with the risk than those currently specified. Secondly, there was concern that the forest industry might be required to pay a road levy that would not be equitably applied to all road users, but this concern is outside the scope of our assessment.

5.4 Scope for Improvement

There seems to be a need to review road designation and signage for fire protection purposes to allow a greater degree of shared purpose between land managers and fire authorities. We understand that this is a complex issue to resolve, but its importance demands attention. We suggest that the effects of these relatively new provisions need to be reassessed for their actual effectiveness after a reasonable period of implementation, and that, if warranted, a working party be formed as part of the next Code revision process. This working party should include all concerned parties, e.g. fire protection services, road safety authorities, local government and forest industry, with the objective of redefining the problem and finding solutions.

5.5 Conclusion

The Code content or other aspects of the regulatory system, and their implementation processes, are adequate in meeting this criterion. Suggested improvements are:

The system of road designation and signage for fire protection purposes needs to be reconsidered during the next Code review process, if it is not achieving good long-term outcomes for fire protection and for the safety of fire fighters and others.

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. This would facilitate better forward planning for investments in roads.

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

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>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.</p> <p>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.</p> <p>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.</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- 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

Key legislation regulating this criterion is the *Environment Planning Assessment Act 1979*, the *Fisheries Management Act 1994*, and *Threatened Species Conservation Act 1995*. Along with relevant Commonwealth legislation, these Acts require that native plant and animal communities listed as rare, threatened or endangered receive special management and protection. In addition, plantation establishment can occur only where broad-scale clearing of native vegetation is not required, including native forest and non-forest vegetation. Clearing is limited to the removal of individual trees or small patches of native vegetation subject to the requirements of the *Threatened Species Conservation Act 1995*. To assist plantation developers and local government, information is provided by the State government that alerts an applicant of potential biodiversity risks. This information includes regional conservation plans and information on threatened or endangered native plant communities or animals. Officers of the PAU are available to assist an applicant in identifying flora and fauna values that need protecting, and to advise on conditions that may vary Code requirements while avoiding adverse impacts.

The main provisions that operate to protect these values are:

- Compliance with the State acts mentioned above and with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
- Ecological Vegetation Class maps and assessments of contribution to regional conservation values
- Vegetation clearing legislation
- Requirements of planning schemes, i.e. zoning of land use
- Plans for fire management and control to prevent damage to native vegetation

Prescriptions and processes for the management of remnant native species and habitat are provided by the State government (e.g. Baker et al. 2009) and are included in plantation development guidelines developed by large plantation companies or government authorities.

An application for authorisation of a plantation is subject to a seven part test for threatened species (Industry and Investment NSW 2011c). This test considers habitat requirements of any threatened animal species within a 5 kilometre radius of the boundary of the property, and any related recovery or threat abatement plans. There are also strong limits on clearing plant communities occurring on the property that are listed for conservation in the regional vegetation schedule. In addition, any patch of native vegetation larger than one hectare must be retained.

6.3 Comments on Existing Processes

Maps illustrating ecological vegetation classes, their conservation status and threats, and management guidance support the implementation of the Code. Officers of the PAU provide advice on identification and management of threatened habitat, or assist in obtaining that advice from other government departments.

In some cases, minor breaches of the Code have been noted in internal audit or post-operation reports, e.g. felling of some native trees that were not included in the harvesting plan, but these breaches had only minor impacts on biodiversity. We were not told of any serious breaches of the Code during our discussions.

6.4 Scope for Improvement

We have no specific suggestions for improvement.

6.5 Conclusion

We conclude that the Code content and processes of implementation are adequate for protecting animal and plant communities during plantation development and management in NSW.

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

Code provisions for soil and water protection focus on buffer zones, slope limits that are soil-type-specific, and the design, construction and maintenance of roads and drainage features. Water quality is not explicitly addressed in the code, but it is assumed to be satisfactory if soil is protected and non-Code requirements about chemical use etc. are met.

A buffer width of 20 metres is required on both adjacent sides of all rivers and wetlands. Machinery movement and planting restrictions apply within 10 metre of a drainage depression or drainage line. Rainfall erosivity maps are available for the State and soils are allocated a defined class of regolith stability (erosion hazard). The combination of these two properties sets a limit for cultivation on slopes. Harvesting traffic needs to cease if soil is rutting to more than a prescribed depth, or if runoff is occurring. Roads, stream crossings and drainage features are designed and implemented to keep sediment inputs to streams to an acceptable level. Designs are produced to meet a 1 in 5 year high rainfall event. Operational plans are required for road construction, and must be prepared before commencement of the operation. Using this information, the PAU produces a map to accompany an application that shows where different soil management classes occur. As well as conserving soil, it is assumed that these Code provisions protect water quality.

Buffers, roads and drainage features are checked during audits by the PAU, but assessment of water quality outcomes (particularly dealing with any reports of breaches) is the responsibility of the Office of Environment and Heritage. This Office sometimes requests the PAU to provide the first inspection and assessment of an alleged breach suspected to be of minor environmental consequence.

The use of agricultural chemicals (i.e. herbicides, fungicides and pesticides) in plantation forestry and other land uses is regulated by the *Pesticides Act 1999*, which is administered by the Environment Protection Authority. Chemical users must comply with label requirements, and special circumstances for aerial application methods. In addition to the *Pesticides Act 1999*, plantation forestry in NSW relies on buffers prescribed by the Code to ensure that the chemical contamination of water is avoided.

7.3 Comments on Existing Processes

Scientific monitoring of water quality suggests that management practices in plantation forest in NSW are adequate to meet water quality requirements (Webb et al. 2007), which is consistent with very few water pollution events attributable to plantation forestry being reported to the PAU by the Office of Environment and Heritage, local government bodies or catchment management authorities.

Soil damage by trail bikes leads to serious soil erosion and water sedimentation in some localities. This issue spans plantations and native forests on public and private land, but regulation of this recreational activity is more difficult in public forests because of public access

rights. In some cases, initiatives are underway to try to bring all stakeholders including police and local government together to regulate and coordinate trail bike use and thereby minimise the problem, but progress remains slow.

Plantations in NSW are currently not required to have a water extraction licence. Hence, water yield in relation to plantation activities is unregulated. However, it is recognised that regulation would require consideration of plantation areas and ages, and rainfall patterns (Webb et al. 2007), and water balances under all land uses. We note that the knowledge base, decision support tools, and regulatory mechanisms for making such decisions in conjunction with various other land uses in a catchment are not yet well established in most regions of Australia.

7.4 Scope for Improvement

The Code would be more complete in addressing environmental requirements if it cross-referenced other legislation in relation to water quality and the use of chemicals. Soil damage and sedimentation of waterways due to recreational uses such as trail bike riding should be noted in audits, and efforts continued to restrict such activities to ways that are of low environmental risk.

7.5 Conclusion

The Code, related legislation, and their implementation are adequate in meeting this criterion, but the Code would be more complete in addressing water quality and the use of chemicals if it cross-referenced the related legislation and specified the need to comply with it.

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

Soil protection is a central element of the Code, which prompts high risk factors such as slope, erodibility, and site disturbance to be considered at the planning and operations stages. For

designing appropriate cultivation methods (mounding, ripping and spot cultivation) the Code prescribes slope limits using a matrix of regolith types and rainfall erosivities. Adherence to cultivation, roading and drainage specifications is a particular focus of the auditing process. When outcomes are unsatisfactory, corrective actions are required to be implemented, and the application of which may be subject to a repeat audit.

8.3 Comments on Existing Processes

Use of harvesting residues (slash) is required or recommended in various parts of the Code for soil protection during harvesting operations, e.g. for protecting soils from rutting or compaction. However, there is no clear recognition in the Code that slash and litter are also important site resources of organic matter and nutrients that contribute to the maintenance of site productivity. Slash retention during re-establishment is not common practice in NSW. There needs to be better recognition in the Code of the site productivity risks associated with removing this resource, and the need to specify slash retention as best practice.

8.4 Scope for Improvement

Whole tree harvesting, windrowing and burning of slash, and other major displacements of organic matter are risks to the soil resource and sustained productivity, but impacts are likely to be strongly influenced by site and soil. Recognition of the risks is required in the Code or guidance documents, along with guidance on best practice harvesting and slash management.

8.5 Conclusion

Existing Code content and implementation processes are generally adequate for protecting soil resources. An action for improvement is to strengthen provisions in the Code or guidance documents for slash management during the inter-rotation management phase, particularly as technologies are developed that enable bark and non-woody biomass to be left fairly uniformly distributed across the site.

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 includes provisions for the protection of environmental (cultural) heritage. Protection of Aboriginal heritage is required by the *National Parks and Wildlife Act 1974*, and protection of non-Aboriginal heritage is required by the *Heritage Act 1977*.

Amendments to the *National Parks and Wildlife Act 1974* brought due diligence requirements into force for the protection of Aboriginal Objects in NSW. A Due Diligence Code (Environment Climate Change & Water NSW 2010) is provided to assist plantation officers in their duties. In this document, plantation officers are provided with an assessment process with the following four steps and a flow chart as part of their pre-application assessment:

1. A register of places of Aboriginal heritage should be searched and administered by the Office of Environment and Heritage for the presence of any relevant places and objects during the planning phase of a plantation. The register is the Aboriginal Heritage Information Management System established under section 90Q of the *National Parks and Wildlife Act 1974*.
2. Field inspection by officers, with guidance on the process if objects are identified or listed in the Aboriginal Heritage Information Management System search.
3. Consultation with Aboriginals regarding their heritage is not a formal requirement of the due diligence process, but it is always encouraged prior to the establishment of a new plantation as it may assist in identifying objects.
4. Record keeping, which is important for proving due diligence.

In addition, heritage bodies are sometimes consulted, and the pre-application site inspection is used to identify any other potentially significant features of cultural heritage. The Code also specifies buffer widths of 10-50 metres to be placed around sites that are discovered during planning or subsequent operations. Significant sites are marked on maps submitted as part of the plantation authorisation application process, and most applications include such identifications.

To date, no notifications or application to harm or disturb objects of cultural heritage have been reported as a result of observation during plantation operations.

Although plantation activities less than 30 hectares in total area per property are exempt from requiring an authorisation, this does not exempt such activities from complying with the legislation protecting heritage values in NSW.

9.3 Comments on Existing Processes

It is recognised that the Aboriginal Heritage Information Management System is not comprehensive or up-to-date, and that the designated Aboriginal party might not be completely familiar with the specific area in question or, to protect a site they may be unwilling to divulge the exact location and identity of a significant place. These are complicating issues, but to-date no serious breaches or other problems of conflict with cultural heritage values have arisen in relation to plantation activities.

Without input from the local Aboriginal community, the discovery of new Aboriginal objects or places is at the discretion of the officers of the Department of Trade and Investment, Regional Infrastructure and Services, and anyone else working or planning work at the site. It then

becomes the responsibility of these parties to ensure that they are appropriately trained and informed of requirements of the relevant cultural heritage legislation.

9.4 Scope for Improvement

We suggest no specific improvements for this criterion.

9.5 Conclusion

Existing Code content and implementation processes for the protection of cultural heritage are adequate, as there are processes and supporting guidance in place to assist the plantation managers in complying with legislation and the National Principles.

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.
-----	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- 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

Fire protection measures are specified in the Code in several places. Applications for plantation establishment need to specify zones of protection (setbacks) from various features (e.g. buildings and power lines) and include a continuous road around the perimeter dedicated to access for fire protection (fire road) unless landscape features render this impractical. Fire roads and turnarounds may also be constructed within the plantation development area. Designated fire roads need to meet specific construction and maintenance standards, and their signage must meet specifications. Large plantation companies liaise with regional fire protection agencies to establish communication and command protocols to be deployed in the event of a fire. Plantation owners are required to provide to the local fire authority a digital layer showing fire road and water storage locations within 3 months of completion of establishment for plantations exceeding 100 ha.

Management of weeds is not considered in the Code, but weed management obligations of plantation managers are the same as those of other land managers. This includes a responsibility

to control noxious weeds as regulated under the *Noxious Weeds Act 1993*. The NSW Invasive Species Plan (NSW DPI 2008) aims to prevent new incursions, contain existing populations and adaptively manage widespread species.

10.3 Comments on Existing Processes

Our comments on fire roads and signage in sections 5.3 and 5.4 also apply here.

Weeds and pests cannot always be completely controlled or eliminated from plantations due to technical and financial limitations, and this is recognised in the NSW Invasive Species Plan (NSWDPI 2008). Plantation managers put considerable effort into weed management beyond the need to manage competition with plantation trees. Weeds like blackberry are spreading rapidly and they are generally controlled around the perimeters of plantations, but infestations within plantations seem to be becoming a serious concern as a fire hazard and seed source for infestations beyond the perimeter of the plantation. Grazing is used partially as a weed control measure by some plantation managers, but cattle can contaminate streams with sediment, nutrients and bacteria if direct access to a stream is not prevented (Smethurst and Neary 2010, Smethurst and Petrone 2010). This issue raises a conundrum about buffer zone management, because buffers are used in plantations to protect water quality, but that function is circumvented if cattle frequent the streams, and unmanaged buffers can substantially increase the weed risk.

We were informed of an increasing problem of ‘pine wildling’ invasion of some native vegetation in southern NSW and that it is not currently being well managed. It is not clear whose responsibility it is to control these wildlings.

Pests and diseases are not addressed in the Code, but they are the responsibility of the biosecurity section of NSW DPI. An example of the risk posed by diseases, and an inability to fully control these risks is provided by the incursion of Myrtle rust on the central coast of NSW. The incursion was first registered in April 2010, but may have been in the area for a year or two before being recognised. This rust is a threat to eucalypt plantations and other species in the *Myrtaceae* family. Delays in recognising the threat and implementing actions have been accompanied by its spread to additional areas in both NSW and QLD. This example indicates that biosecurity measures should not be relaxed, and indeed there is a good case for increasing our investment in biosecurity.

The potential gene transfer from plantations to some native forest species was recognised, but the potential impact is unknown and no guidelines are available for managing this sort of gene flow.

10.4 Scope for Improvement

The Code doesn’t specify the need for applicants of plantation development approvals to consider regional or local fire risks and protection measures, or to inform local authorities of their fire protection measures. However, several such measures are dealt with outside the Code. We propose that the Code include cross-references to these measures.

There is a case for reviewing the current practices of buffer management with the aim of improving environmental outcomes in relation to weed control, protection from fire, and

managing grazing, while retaining their primary function of buffers for soil and water protection. It might be possible to develop management systems that exclude livestock from streams, and allow some harvestable trees to be planted in the buffers and thus control weeds. The Private Native Forestry Code of Practice for Northern NSW (DECC 2008) for private native forestry, for example, contains provisions for harvesting some trees in buffers, which might provide a useful guide for managing plantation trees in buffers.

It would be appropriate for the Code to cross-reference weed and other biosecurity responsibilities of plantation managers to other regulatory measures, and to guidance in companion documents that are specific to plantations.

10.5 Conclusion

The Code does not address the risks from weeds and other pests, but the responsibilities of plantation managers for addressing these risks are regulated by other Government agencies. It would be useful to cross-reference these responsibilities and links in the Code.

Existing Code content, other regulations, and implementation processes focus on within-plantation protection against fire, weeds, and other pests, and are generally adequate. However, there is scope for greater control and protection from weeds in some landscapes.

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 does not mention the need for environmental training.

11.3 Comments on Existing Processes

It is essential that staff at all levels are adequately trained to interpret and implement the Code. This is well achieved by large plantation companies. However, some small growers may have inadequate expertise or resources.

11.4 Scope for Improvement

Environmental management is complex, including understanding and implementing 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 an understanding of the key principles and practices of environmental management. This training needs to include machine

operators and other contractors and arrangements for continuous improvements in skills. There is merit in co-ordinated and accredited training programs containing different modules. A co-operative effort by both private sector and public agencies should be considered for this purpose.

11.5 Conclusion

Training needs of field supervisors and operators in environmental management should be more specifically addressed in the Code.

12. OTHER NATIONAL PRINCIPLES

There are a further 23 National Principles (NPs), but many of these overlap extensively with those of Environmental Care dealt with above. 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 NP restates a provision which also exists under Commonwealth and State worker safety legislation. Large plantation companies go beyond the minimum requirements, but we did not explore to what extent small growers and agro-forestry operators provide safe working conditions. A tool for safety management provides template forms for monitoring and recording safe work practices (Work Cover NSW 2010).

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 Plantation and Reafforestation Act 2001 does not provide an 'as of right' for plantations, but it does provide for certainty of timber harvest from approved plantations. NSW legislation provides for the separation and sale of the land, trees and their products, specifically carbon. The Code does not specifically recognize the general contribution that plantation forestry can make to social and economic values, and it does not emphasize the need for economic plantation operations. However, the Code was introduced specifically to foster plantation development, and comments by several plantation managers confirmed that this was the case. Environmental effects of plantations are considered earlier in this assessment (sections 5-10).

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 recognized in the Code as a major potential environmental risk, and they are dealt with in several sections of the Code. In relation to road planning external to the plantation, i.e. those roads provided by local government, some local governments complain that they are not given enough notice of timber harvesting. A long term plan 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 an environmental concern, but they become so in some instances where drainage problems arise that lead to increased sediment delivery to streams. Other aspects of these NPs 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 as part of the basis of the Code, but no guidance is given and it is therefore assumed plantation managers will make only sound economic decisions, including those involving species, site and silviculture. Only non-complying plantations, which represent only a very small proportion of the area, require a statement of socio-economic impact statement to be included in the application. Recent developments in the management investment sector of the plantation industry in NSW (and several other states) brings into question the attainment of NP 5.1, but it was beyond the scope of our assessment to analyse this situation in detail. Other aspects of these NPs 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: The NPs for 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: The NPs for 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: The PAU conducts a targeted auditing program on plantations selected to cover the range of plantation types (size, ownership, species etc.). Each audit focuses on road stability, stream crossings, buffer zones, slope limits, and vegetation in retained areas. Emphasis to-date has been on auditing plantation establishment, but some harvesting audits have also been conducted, and it is envisaged that the level of auditing of harvesting and maintenance operations will increase. Investments in plantation establishment by the industry have slowed, which may allow PAU staff to redirect their auditing efforts. Corrective actions and reauditing are sometimes required, and there is scope for penalties to be applied. The value of auditing would increase if there was a systematic process to capture the lessons on an annual basis and to use them to improve practices and the Code. Most large plantation companies are certified for forest management to either the Australian Forestry Standard or the Forest Stewardship Council standard. These certification schemes require audits, but detailed audit results are not publicly available.

Notices of environmental incidents in plantation forestry can be lodged directly with the PAU, but in practice most alleged incidents are reported to local government. We expect that all serious allegations eventually come to the notice of the Office of Environment and Heritage. A search of the database of phone calls received by this office revealed eight calls from 2000 to January 2011. These calls expressed concerns about smoke, sedimentation of water from trail bikes or harvesting, and spraying operation. None of these calls led to an incident investigation, but several were already known of by Primary Industries. None of these incidents were Code-related and therefore would not be noted in an audit by PAU officers. The ephemeral nature of some events also reduces the likelihood that an audit or investigation could provide clear outcomes. Trail bikes (particularly on public land where access is unrestricted) and smoke are concerns recognised by the State government, but their management is not currently a Code matter. This information demonstrates that the Office of Environment and Heritage has no serious on-going concerns about environmental outcomes from plantation forestry activities.

Officers of the PAU have a key role in providing an effective interface for implementing the Code, but there are only six officers to cover all plantation activities in the State. For several years prior to 2009, i.e. when the numbers of plantation development notices were very high, these officers were unable to conduct much auditing because they were committed to plantation development applications. If the rate of plantation development returns to high levels, PAU resources should be increased to enable it to maintain an effective auditing role as well as process plantation development applications.

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

Wayne Garrard and other PAU staff provided substantial background documents and information on regulations and plantation forestry in general. They also co-ordinated and accompanied us on field visits and discussions. We very much appreciate their cooperation. Staff from other organisations consulted (Appendix D) were also helpful in facilitating this assessment.

14. REFERENCES

- Baker L, Garrard W, Martin B (2009) Best management practices for retained areas in forestry plantations. NSW DPI.
- DECC (2008) Private Native Forestry Code of Practice for Northern NSW. Department of Environment and Climate Change NSW.
<http://www.environment.nsw.gov.au/resources/pnf/0837copnorth.pdf>
- Environment Climate Change & Water NSW (2010) Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. NSW Government Department of Environment Climate Change and Water.
<http://www.environment.nsw.gov.au/resources/cultureheritage/ddcop/10798ddcop.pdf>
- Gavran M, Parsons M (2011) Australian Plantation Statistics 2011. Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
http://adl.brs.gov.au/data/warehouse/pe_abares20110831.01/AustPlantationsStats_2011.pdf
- Industry and Investment NSW (2011a) Changes to the Plantations Act and Code: Summary.
http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/371885/Code-summary.pdf
- Industry and Investment NSW (2011b) Changes to the Plantations Act and Code: Fire standards. http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0013/312061/Fire-standards.pdf
- Industry and Investment NSW (2011c) 7 part test in accordance with Environment Planning Assessment Act 1979 203 part 1, Section 5A(2).
http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0007/365839/Section-37-Permit-7-Part-Test.pdf
- NSW DPI (2008) NSW Invasive Species Plan 2008-2015.
- Plantations2020 (2007) Plantations for Australia: The 2020 Vision. Establishing Plantations in Australia: A review of Legislative and Regulatory Frameworks. Plantations for Australia: the 2020 Vision.
http://www.plantations2020.com.au/assets/acrobat/PlantationsLegislation_May08.pdf
- Smethurst P, Petrone K (2010) Streamside management zones for protection of water quality. Fact sheet for managers and policy-makers #13 Landscape Logic Commonwealth Environmental Research Facilities Hub, University of Tasmania, Sandy Bay, Tasmania, Australia <http://www.landscapelogicproducts.org.au/site/products/51-streamside-management-zones-for-water-quality-protection>
- Smethurst P, Neary D (2010) Farm-scale sediment sources: tree harvesting, cattle and roads. Fact sheet for managers and policy-makers #4, Landscape Logic Commonwealth Environmental Research Facilities Hub, University of Tasmania, Sandy Bay, Tasmania, Australia <http://www.landscapelogicproducts.org.au/site/products/50-farm-scale-sediment-sources-tree-harvesting-cattle-and-roads>
- Webb A, Jarrett BW, Turner LM (2007) Effects of plantation forest harvesting on water quality and quantity: Canobolas State forest, NSW. In Wilson, A.L., Dehaan, R.L., Watts, R.J., Page, K.J., Bowmer, K.H., & Curtis, A. Proceedings of the 5th Australian Stream Management Conference. Australian rivers: making a difference. Charles Sturt University, Thurgoona, New South Wales.

http://www.csu.edu.au/research/ilws/news/events/5asm/docs/proceedings/Webb_Ashley_443.pdf

WorkCover NSW (2010) Forest Industry Safety Tool.

http://www.workcover.nsw.gov.au/formspublications/publications/Documents/forest_industry_tool_2110.pdf

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

CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DPI	Department of Primary Industries
FEA	Forest Enterprises Australia
PAU	Plantation Assessment Unit, Primary Industries, Department of Trade and Investment, Regional Infrastructure and Services
NP	National Principle
NSW	New South Wales
QLD	Queensland

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

Agriwealth
NSW Environment Protection Authority
Forests NSW
Forest Enterprises Australia
Gunns Limited
Hurford Hardwood
Kyogle Shire Council
Northern Rivers Catchment Management Authority
PAU
South East Fibre Exports
Super Forest Plantations
Willmott Forests Limited

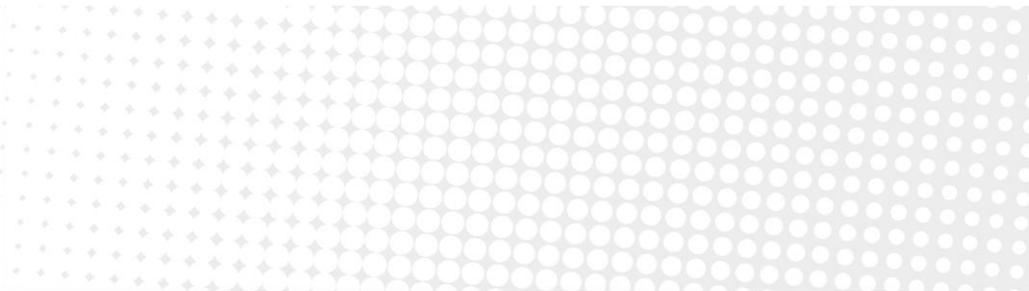
APPENDIX E – MEETINGS AND FIELD VISITS

Visit 7-9 March 2011

Meeting at Primary Industries offices, Tumut, NSW
Field visit to Willmott Forests – pine establishment
Field visit to Forests NSW – pine harvesting

Visit 6-7 April 2011

Meeting at Primary Industries offices, Wollongbar, NSW
Field visit to farm forester - cabinet timber species establishment
Field visit to FEA – eucalypt establishment
Field visit to Hurford Hardwood – eucalypt establishment



Contact Us

Phone: 1300 363 400

+61 3 9545 2176

Email: enquiries@csiro.au

Web: www.csiro.au/flagships

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.