

Technical Report 178
**Summary of Australian codes of forest
practice as they pertain to managing
commercial plantations in stream-side
buffers on cleared agricultural land**

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Summary

The regulatory framework governing commercial plantations in stream-side buffers of cleared agricultural land (also called riparian forestry) is summarised for each Australian state and territory, along with their mechanisms of revision. In relation to forestry practices in general, each jurisdiction has attempted to capture all environmental regulatory requirements in one document that is referred to as a code of forest practice. Few codes specifically recognise the desire by some farmers and other environmental managers to use commercial plantations in stream-side buffers to achieve environmental and economic objectives. In one jurisdiction where this desire is recognised, i.e. in Tasmania, the current wording still discourages this activity in some instances, because harvesting and machine use is precluded from within specified buffer distances that depend on stream class (size). The most recently revised code (in Victoria) provides for harvesting of stream-side buffers established on cleared farmland, but this provision is not easily found in the code because it is an exempt activity. In codes where this desire is not recognised, the regulatory framework precludes the activity or it is discouraging due to vagueness about this practice. Hence, this summary finds that all codes of forest practice in Australia provide inadequate encouragement of the careful use of commercial plantations in stream-side buffers on cleared agricultural land.

In several jurisdictions, planning approval for such an activity would be required from a local government authority that might have the right to amend plantation activity approvals prior to a plantation reaching harvestable age. Hence, confidence in the right to harvest would be jeopardised.

Most jurisdictions have a revision mechanism for the code of forest practice that allows for expert input and public comment. Some have a revision cycle of five or ten years, but others are unspecified. Local government planning schemes can generally be amended more frequently.

Introduction

Codes of forest practice were introduced in most Australian states and territories about two decades ago, and they have since been revised several times. The initial motive for codes was to improve environmental management during harvesting operations in native forests. As the focus of forest activities changed, the codes also evolved. Code revisions recognised the need to accommodate broad-scale plantation developments initially in a predominantly native forest landscape, and later in a cleared agricultural landscape.

Around the country there is increasing interest in using buffer strips along watercourses in the agricultural landscape to mitigate the potentially adverse effects of farming practices on water quality (Lovett and Price 2007). Buffer strips can include various combinations of herbs, shrubs and trees for non-commercial or commercial objectives. This type of practice is often referred to as riparian protection, and is a key investment being considered by Natural Resource Management Regions.

It should be recognised that stream-side buffers might not coincide precisely in width with the ecological definition of a riparian zone, the latter referring to that zone beside a stream that contains distinctive soil or plant characteristics that are directly associated with wetness close to the stream, as distinct from drier, up-slope zones.

Until now there has been minimal consideration of how codes of forest practice should apply to cases where farmers working in a cleared agricultural landscape might want to exclude stock from buffers adjacent to watercourses and revegetate these areas to provide environmental protection, while also seeking a commercial return from trees grown in these buffers. Several international and some national examples suggest that environmental and commercial benefits are not necessarily mutually exclusive (Smethurst 2004); some examples are shown in Figures 1 and 2. It is also possible that the inclusion of a commercial incentive might encourage adoption of riparian protection and therefore hasten and broaden the delivery of environmental benefits. A commercial incentive would add to others such as government subsidies, market pressures via certification schemes, voluntary codes of farming practices, and the existing goodwill of many farmers toward improved environmental management on their farms. Robins (2002) recognised that harvesting of wood from riparian zones could provide multiple benefits to farmers, the environment and the community, while recognising that the regulatory environment to support these practices varied greatly amongst states: “Some planning codes prohibit the harvesting of wood on riparian land altogether, while others enforce certain conditions . . .”. This report elaborates on these differences amongst the codes.

This report was motivated by two main questions:

1. Does the current regulatory framework encourage the use of commercial plantations in stream-side buffers on farms?
2. What are the mechanisms by which such revisions might be included?

Primary sources of information

The regulatory and planning framework for plantations in Australia is summarised at national, state, territory, and local government levels at the ‘Planning Plantations’ website (http://www.planningplantations.com.au/assets/content/plantation_management/regulation_planning/index.html). Key components of this framework are the codes of forest practice for each state or territory, which are also available via links on this website.

In each jurisdiction, the code of forest practice is the key instrument by which commercial plantation activities are regulated. However, depending on the specific jurisdiction, other acts, regulations and instruments impinge to various degrees on plantation activities, especially in relation to watercourses. All states and territories, for example, have acts or regulations that affect local government planning schemes, and water, vegetation and soil management.

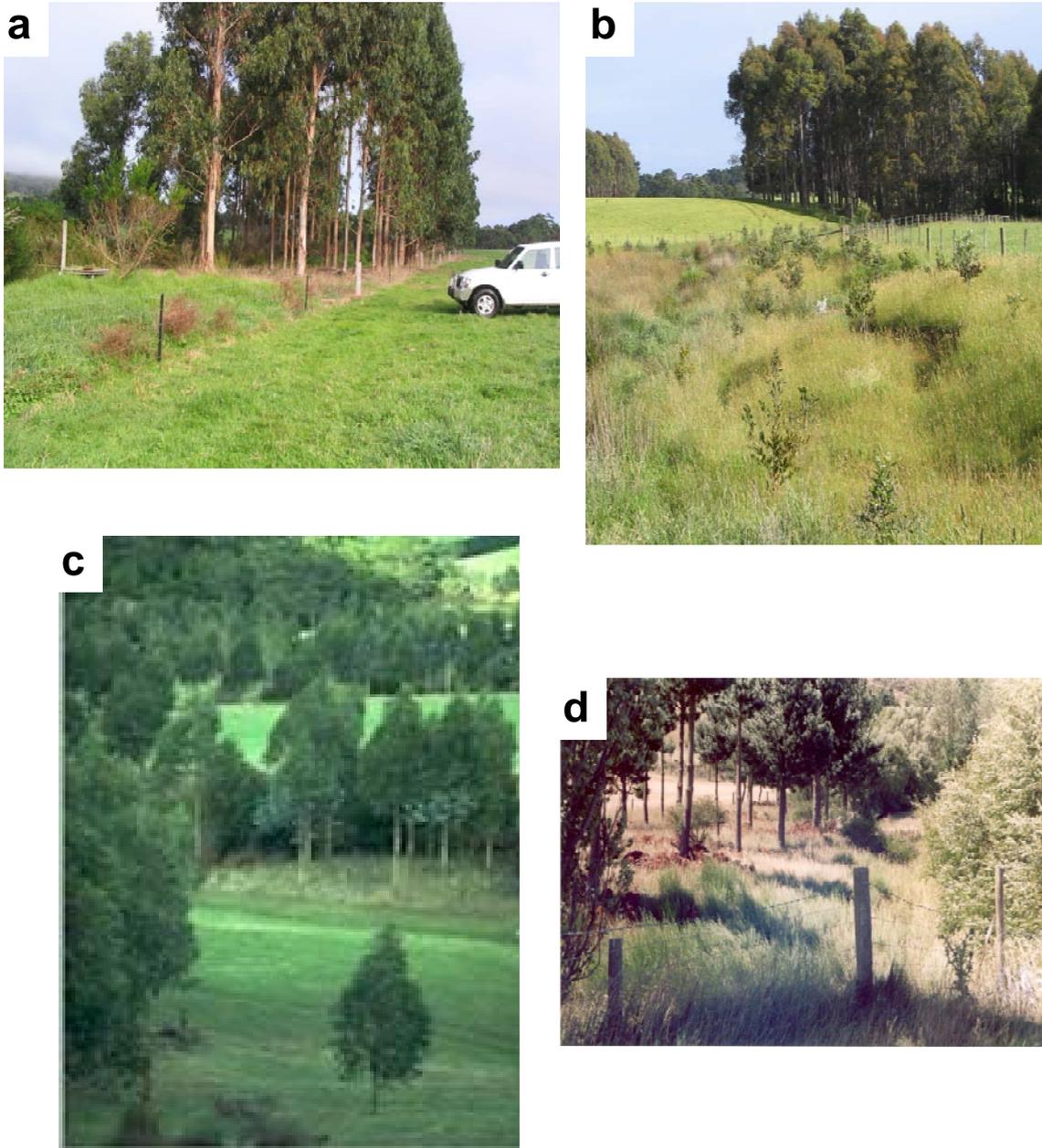


Figure 1. Examples of multiple use riparian or stream-side forests in Australia and New Zealand that include wood harvesting. **a.** *Eucalyptus globulus* plantations near Albany, Western Australia (WA), Australia. **b.** *E. nitens* and *Acacia melanoxylon* plantations near Burnie, Tasmania, Australia. **c.** Yan Yan Gurt River, Victoria, Australia (brochure available at: http://www.plantations2020.com.au/assets/acrobat/Web_of_trees_72.pdf). **d.** South Island, New Zealand.



Figure 2. Examples of multiple use riparian or stream-side forests in USA and Germany that include wood harvesting (Smethurst 2004). **a.** Bear Creek, Iowa, USA. Thinning for Christmas trees (softwoods) and firewood (hardwoods) had commenced. **b.** Bavaria, Germany. This hardwood forest had been recently thinned. **c.** Root River, Minnesota, USA. This hardwood forest is managed for wood production and a range of other benefits including recreation. **d. and e.** Southern Germany. Wood production from plantations (softwoods in these examples) is allowed down to the edge of the stream. **f.** Baden-Württemberg, Germany. Many streams flowing through farmland are adjoined by narrow bands of trees managed for firewood production or other timber uses.

These sources of information were scanned to distil the following summary in relation to the use of commercial plantations in stream-side buffers on farms. This summary was also checked by one or more experts in each jurisdiction (see Table 1 and Acknowledgements).

Queensland

Local governments in Queensland are attempting to regulate the establishment of timber plantation establishment through their local government planning schemes, but regulation is not being done consistently and plantation managers have been seeking a consistent state-wide approach to the regulation of establishment of their plantations. Some local governments nominate plantation establishment as a development that needs to have its impacts assessed (assessable development) and a range of development assessment measures may be required (e.g. a code of practice). Other local governments classify plantation establishment as agriculture and not assessable.

Once established, plantation activities are protected by *Section 9 of the Integrated Planning Act (1977)* that sets out development that is exempt from assessment against a local government planning scheme. It includes ‘operational works’ associated with the use of premises for forest practices and ‘works’ in this context is taken to mean those activities beyond the establishment of the land use, e.g. harvesting.

A Code of Practice for plantations has been under development for some years and has now reached an advanced stage. The draft code still needs to go through the regular government consultation processes before it’s approval for wider circulation. However, it is very likely that such a code will carry measures for protecting watercourses (including filter and buffer zones) similar to found in the codes of other states. Filter zones will probably be specified of 5 to 25 m, and buffer zones of 5-10 m (width depending on ‘stream order’ etc.), in which no plantation establishment or management practices are permitted.

There appears to be no documented policy in Queensland that specifically encourages the development of ‘streamside’ plantations. Such a practice is more likely to be relevant to smaller-scale farm forestry than to the larger commercial plantation management activities.

Review process

Because the Queensland private forest regulatory system is still under development, a revision frequency and process has not yet been defined (Table 1).

Table 1: Some aspects of the processes relating to revisions of the codes of forest practice

Jurisdiction	Review frequency	Review process	Contact
Queensland	Not defined	Currently underway; otherwise not defined	Mike Shaw, Forest Policy Group, Queensland Department of Premier and Cabinet
New South Wales	5-yearly	Expert and public consultation	Lindsey Paget-Cooke Department of Primary Industries
Australian Capital Territory	5-yearly	Expert and public consultation	Peter Beutel, Forestry Coordinator, Parks Conservation and Lands
Victoria	10-yearly	Expert and public consultation	Department of Sustainability and Environment
Tasmania	5-yearly	Expert and public consultation; research by FPA	Peter McIntosh, Soil and Water Specialist, Forest Practices Authority
Northern Territory	Not defined	Not defined	Matt Darcey, Director Crops, Forestry & Horticulture Division, Department of Primary Industry, Fisheries & Mines
South Australia	5-yearly proposed	Currently underway; otherwise not defined	Peta Crewe, Forestry Development Adviser PIRSA Forestry
Western Australia	5-yearly	Formal committee structures established by the Forest Industries Federation WA, including consultation with industry, government and regional planning groups.	The Executive Director, Forest Industries Federation (WA) Inc.

New South Wales

Farm forestry in New South Wales (NSW) is encouraged by the ‘Farm Forestry Strategy for NSW’ of 2003, which defines this activity as ‘The incorporation of commercial tree growing and management by farmers into farming systems for the production of both wood and non-wood products, increasing agricultural productivity and encouraging sustainable natural resource management.’ The strategy’s vision is ‘In NSW, farm forestry is regarded as a mainstream farm enterprise delivering commercial and environmental benefits’.

Although the main instrument for regulating forestry practices in NSW and providing a guarantee of harvest is the Plantations and Reafforestation Act 1999, and its associated Plantations and Reafforestation (Code) Regulation 2001, plantations less than 30 ha in one discrete planted block are exempt farm forestry (EFF), which would be the case for many farm forests including riparian buffer plantations. These EFF plantations are not subject to the *Environmental Planning and Assessment Act 1979* (PR Act), so are not governed by local council requirements. However, EFF plantations may be subject to other legislative requirements, such as the *Protection of the Environment Operations Act 1997* that regulates water pollution. Despite their potentially exempt status, many plantations of 30 ha or less are in fact authorised under the PR Act, and the assessment process for these plantations is no different to that for other plantations. Time limits for assessing applications are 14 days for plantations that comply with the Code and 40 days for those that don't.

However, in buffer zones, riparian plantations designed to be harvested cannot be approved (if authorisation under the PR Act is sought), because the code prescribes the use of non-harvestable buffers of 20 m width on rivers, and 10 m width on drainage lines in low coherence soils with a high potential to deliver fine sediment (i.e. regolith class R4 as defined by the Code). Establishment is allowed between 5 and 10 m of the centre of drainage depressions on R4 soils, and harvesting is allowed between 5 and 10 m of the centre of these drainage depressions. With special precautions planting and harvesting is permitted in other classes of drainage lines and depressions.

When consulted about the concept of riparian forestry, the regulator described two possible scenarios. In the first scenario, vegetation could be planted in riparian areas with a view to low intensity harvesting (i.e. selective timber removal from time to time). This scenario provides for a more active management of riparian areas than the alternative of merely 'locking up' these areas (as could be the case where incentive funding is paid by a Catchment Management Authority, CMA). In the second scenario, plantations would be established in riparian areas with a view to completely harvesting the trees later, but this scenario was considered less appropriate because of the likely damage to the ecosystems that had developed in the riparian forests.

The following general comments were received from the regulator. In NSW, 'riparian areas' tend to be defined as relatively narrow areas (e.g. 20 m either side of a watercourse in the *Soil Conservation Act 1934*; 40 m either side in the *Rivers and Foreshores Improvement Act 1948*; and 10 or 20 m for PR Act buffers) whereas the concept of riparian buffers as suggested in this report could include wider zones.

Another comment was that harvesting in riparian areas creates operational issues including: the need to protect streams and their banks; access issues (particularly if areas are fenced to exclude stock); and the ribbon layout. Scale was another issue; to produce sufficient timber to sell profitably, groups of landholders may need to cooperate to harvest and market their products. Also, to-date, farmers in NSW have generally sought to establish plantations on less productive areas of their land, e.g. slopes that are unsuitable for cropping and grazing, rather than stream-side zones that tend to be more productive. In NSW incentive funding is available from CMAs to enhance or establish riparian vegetation, but it was thought that CMAs are less likely

to provide funds if the vegetation is to be harvested, and funds are unlikely not be available for the planting of exotics species.

Review process

The Code must be reviewed every 5 years, but the PR Act requires only one review, i.e. after the first 5 years. The PR Act and Code are currently under review. It is not anticipated that recommendations of the review will include any provisions specifically aimed at encouraging the establishment of plantations in riparian areas.

Australian Capital Territory

The Australian Capital Territory (ACT) had only 16,000 ha of forest plantations (mostly *Pinus radiata*) prior to the 2003 fires and now it has less than 9,000 ha. The ACT Government is currently reviewing the plantation estate and considering converting substantial areas back to native forest and grasslands, particularly the ex-plantation estate in the water catchment for the ACT. Additionally, one of the four plantations in the ACT has been rezoned for urban development. Commercial harvest of native forests ceased in the 1960s. After conservation reserves and urban areas, stock grazing is the next major land use in the ACT. There is no freehold land in the ACT - instead all farmers are leaseholders.

The South-West ACT Rural Sub-Catchment Plan 2003 encourages the establishment of native vegetation in stream-side buffers of average width 30 m on both sides of a stream to control erosion, but no mention is made of the potential to harvest such trees. The Department of Territory and Municipal Services (TAMS) assesses applications for the development of commercial plantations. Under the plan, commercial plantations are a non permissible land use on any area in the ACT except where there are existing plantations.

Forest plantation activities require authorisation under the Environment Protection Act 1997 (EPA) of the ACT. The current ACT Code of Forest Practice was produced in 2005 to cover activities in the then ACT Forests estate. ACT Forests was the government plantation manager for the ACT until 2006. ACT Forests has subsequently been included in a single land management agency for the ACT, called Parks, Conservation and Lands (which sits within TAMS). The Code of Forest Practice has been worded to cover all Parks, Conservation and Lands estate. The Code is consistent with Environmental Authorisation No. 288 and its associated schedules. One schedule specifically deals with watercourse management. Activities outside this authorisation, like the suggested use of commercial plantations in stream-side buffers on farmland, would therefore require an additional authorisation as well as approval from the ACT Planning Authority through a Development Application.

As with codes in other states and territories, the ACT code requires the preparation of an operational plan, and it requires riparian management zones (RMZs) for the protection of watercourses. Within these zones, management is focussed on protecting water quality and riparian values, but, importantly, the code does not specifically exclude harvesting of commercial forests provided other values are protected. In addition, the code for the forested landscape includes a vegetation classification of

'Production' in RMZ's currently planted with commercial species; these production zones can be managed as an ongoing commercial crop. Therefore, a revision of the code to extend this practice to cleared farmland would probably be rather simple, but any such plantations would still not be permitted under the Territory Plan which identifies approved land uses across the territory.

Review process

EPA authorisations are reviewed annually, but the code is reviewed every five years.

Victoria

In Victoria, the state planning policy framework indicates that, "Responsible authorities should ensure works at or near watercourses provide for the protection and enhancement of the environmental qualities of watercourses and . . . should have regard to any relevant river restoration plans or watercourse management works programs approved by the catchment management authority."

The Code of Practice for Timber Production (2007) prescribes methods for establishing, maintaining and harvesting plantations for commercial purposes, but it does not apply to agroforestry and small plantations or woodlots of less than 5 ha. However, small growers wishing to ensure that they are able to harvest their planted forests are encouraged to submit a plantation development notice to their local government, even where a notice is not required by the Code. Such submissions by small growers encourages appropriate practice and increases awareness of potential impacts and risk management. All timber production activities greater than 5 ha and less than 40 ha must comply with the requirements of the Code, unless specifically exempted as agroforestry.

For plantations on cleared agricultural land, where gully and drainage lines have been previously cleared of native vegetation, the revised Code does not require buffer or filter widths for protection of watercourses (in contrast to rules for native forests). This means that these areas can be re-forested with native vegetation or forest plantations that can be harvested in the future provided that machinery activity is minimised within 20 m of the watercourse and machinery activity does not occur within 5 m of the saturated zone. The Code states (section 4.2) that "the retention of existing native vegetation and re-establishment of indigenous native vegetation along waterways is encouraged".

If plantations are located in a riparian zone, and they are part of an integrated farming system, then the activity will be classed as agroforestry, irrespective of its size. In general, agroforestry or farm forestry activities do not require a planning permit from local government. Timber production operations in these situations are generally not required to have a planning permit, but must comply with the requirements of the Code. However, some local governments may require permits for plantations greater than 40 hectares in size, typically to manage visual amenity or fire protection issues. Municipalities may have other permit requirements that would be triggered by issues such as native vegetation retention or waterway protection.

In summary, harvesting is not discouraged from within the riparian zone by the current requirements of the Code of Practice in Victoria.

Review process

The Code is revised at least every 10 years, after considering submissions from government officers, other experts, and the public.

Tasmania

Forestry operations in Tasmania (away from streams) are conducted either in accordance with the Forest Practices Act and require a Private Timber Reserve (PTR) to be declared, or in accordance with Local Planning Schemes that in turn are in accordance with the Land Use Planning and Appeals Act (from which PTRs are exempt). The former creates a forest management system that requires management to be in accordance with the Forest Practices Code as administered by the Forest Practices Authority (http://www.fpa.tas.gov.au/fileadmin/user_upload/PDFs/Admin/FPC2000_Complete.pdf).

In practice, most forest owners and managers choose this option, presumably because it reduces financial risk and simplifies management. This situation is summarised on the Private Forest Tasmania website (<http://www.privateforests.tas.gov.au/pubindex.htm>).

The regulatory situation in Tasmania specifically in relation to watercourses is summarised on the DPIWE website (<http://www.dpiwe.tas.gov.au/inter.nsf/Attachments/CDAT-5EJ2XK?open>, “Environmental Best practice Guidelines 1. Legislative and Policy Requirements for Protecting Waterways and Wetlands when Undertaking Works” in Gallagher, S. “Waterways and Wetlands – Works Manual, Environmental Best Practice Guidelines When Undertaking Works on Waterways and Wetlands in Tasmania”). Parts of 16 Acts and two other policy tools are listed. Additional legislative changes pertaining to *vulnerable land* also ensured that all work in riparian zones, which are considered vulnerable land, is done so under the Vegetation Management Policy and therefore in accordance with the Forest Practices Code, which expresses the environmental protection requirements of the Forest Practices Act. Hence, the code is central to the management of plantations beside streams in any part of the Tasmanian landscape.

Many aspects of the regulatory framework, including the Forest Practices Code, encourage revegetation of cleared riparian zones with vegetation including trees, and some parts recognise that works are needed in or adjacent to streams, e.g. planting trees and removing, cutting and trimming vegetation (Water Management Act 1999 part 193). In the code, there is provision for harvesting of trees in native forests in class four stream machinery exclusion zones, selective harvesting in stream-side reserves in class one to three streams. Class four streams are defined as streams having a catchment of less than 50 ha; Class one to three streams have larger catchments. For more details on stream classification and streamside reserve widths, see page 56 of the Code.

In relation to the establishment of plantations adjoining watercourses for revegetating stream-side areas on cleared agricultural land, the code states that, “trees established within 10 m of a class one, two, or three watercourse will not be available for future harvest” and that “plantations will not be established within two metres of any [class four] watercourse”. Such clauses could be a deterrent for farmers who are considering the 10 m closest to class one to three streams for revegetation and commercial riparian forestry, because this zone is very likely to provide the best investment for a mix of environmental and farm management and business purposes.

While class four streams (i.e. small and intermittent) are considered part of the wood production area, a 2004 revision of guidelines recognised that some class four streams required extra protection and their level of protection was up-graded to include buffers as for class three streams

(http://www.fpa.tas.gov.au/fileadmin/user_upload/PDFs/Geo_Soil_Water/newC4guidelines6May041.pdf).

Because the FPA recognises the need to improve the code in relation to riparian forestry on cleared farmland, it approved trial plantations of approximately 100 ha, which were planted in 2006, and it has engaged the CRC for Forestry to provide information on potential water yield and water quality impacts of this practice. It has also approved commercial trials of 50:50 native:commercial plantings in streamside reserves with the aim of providing a commercial return on 50 per cent of the riparian plantings.

Another issue that needs clarification in Tasmania is the use of herbicides in stream-side buffers. With care, some knockdown and residual herbicides can be used adjacent to streams for agricultural activities and amenity plantings.

Review process

The FPC is revised every five years after considering submissions from FPOs, other experts, and the public. The latest version of the code specifically invites improved information in relation to the management of plantations beside watercourses: “. . . provisions are interim and may be subject to new instructions on the basis of new knowledge and research”. The revision is conducted under the direction of the Chief Forest Practices Officer of the Forest Practices Authority.

Northern Territory

The forest plantation industry in the Northern Territory (NT) is in its infancy. Currently, the NT does not have specific regulations for plantation forestry, but this activity is regulated under the Northern Territory Vegetation Clearing and Commonwealth EPBC Acts. The NT Government is developing a policy position with regard to Plantation Forestry as none currently exists.

A ‘Northern Territory Codes of Practice for Forestry Plantations’ (2004) that was gazetted by the then Commonwealth Minister for Fisheries, Forestry and Conservation, Ian MacDonald, provides the basis of the Export Control Regulations for the Great Southern Plantations project on the Tiwi Islands. Although this code is very brief (three pages), it will form the basis for future improvements. The code

requires ‘. . . minimal disturbance of soil in buffers’, but there is no explicit mention of plantations in buffers of cleared farmland. A review process is not indicated.

South Australia

In South Australia (SA), plantation development applications are assessed against the relevant local area development plan (Development Act 1993), which is the key “on-the-ground” development control document in SA. Development plans must be consistent with the Planning Strategy for South Australia, which is the State Government document guiding land use and development for the state, and can be amended for plantations to be established in the future by local councils through the development plan amendment process (which involves mandatory community consultation). Establishment of plantations usually requires consent as a changed land-use.

For plantations outside buffer areas, a plantation manager has the option to take out a ‘right to harvest’ at the time of plantation establishment via a commercial plantation licence. Such a right is valid for the rotation and therefore ensures the right to harvest even if planning amendments are introduced during the rotation that would preclude harvest. However, this licence does not exempt the activity from relevant state laws that regulate how such work is carried out.

Plantation forestry practices in South Australia are guided by the ‘Environmental Management Guidelines for Plantation Forestry in South Australia’ (1997), which are currently being review and renamed the ‘Guidelines for Plantation Forestry in SA’. In relation to stream-side plantations on cleared farmland, these guidelines require a 5 to 20 m vegetated buffer from which harvesting is excluded and where actual buffer width depends on stream or wetland class. Hence, the concept of planting in ‘buffers’ presents a problem and is apparently prohibited, because the term ‘buffer’ refers to ‘undisturbed’ areas in the Guidelines. The ‘Guidelines for Establishing and Managing Commercial Forest Plantations in SA’ (1998) is also available as a guide for landowners and companies new to the forest industry, but the future role or continued need for this document is unclear.

Although the 1998 guidelines were written for all plantation forestry, the emphasis was on industrial-scale developments and the guidelines therefore considered the greatest possible impacts. Industrial forestry generally implies machinery for site preparation, spraying and harvesting on a scale that is generally not appropriate for operating in buffers or riparian zones. If a concept of carefully conducted forestry in buffers is to be considered for cleared farmland in SA, an emphasis on the practicalities of including forestry in buffer zones via codes of practice or guidelines will probably be needed, to convince government agencies and other interest groups that this is an environmentally positive practice worthy of encouragement.

Water rights are an emerging issue around the country, and South Australia is at the forefront of this issue in relation to forestry. The issue is relevant to stream-side forestry where water use on a per tree basis might be higher than further away from the stream. However, stream-side buffers generally do not cover a large proportion of

a catchment. In this context, farmers in SA can include up to 10 per cent of their farm in forestry plantations without requiring special permission from the Department of Land, Water and Biodiversity Conservation. Larger plantations need to be considered within the developing water licensing framework. Only in the south-east of SA has the government confirmed that all new plantations will need a water license for the extraction component of their water use (if water tables are within six metres), otherwise water can be allocated from a reserve set aside for industry expansion back in 2004. The remainder of the detail in terms of water allocation for existing plantations and irrigators operating in a 'consumptive pool' will only be finalised once the Water Allocation Plans are signed and implemented. Operating in the consumptive pool enables water trading, but it also means plantations may be subject to reductions in water use should the management area be under stress. Water Allocation Plans and management of water resources are determined by the respective regional Natural Resource Management Boards and the process is not reviewed through the "Guidelines for Plantation Forestry in SA".

Review process

The current revision will produce the "Guidelines for Plantation Forestry in SA", and it is proposed that it be reviewed every five years.

Development plans are regularly amended to reflect updated local council or State Government policy, introduce changes to zoning, or to implement a new vision for future development. Local councils are formally required to revise the Development Plan for their area every three years, and the process includes public consultation.

Western Australia

The authority for approval to develop plantations in Western Australia (WA) rests with local councils as provided for by The Planning and Development Act 2005, but councils must only provide approvals that are in accordance with State Planning Policies that provide a framework for decision-making on land use and development. The Environmental and Natural Resources Policy of the WA Planning Commission does not specifically mention riparian forestry, but encourages protection and enhancement of watercourses generally, and indicates that planning should 'Diversify compatible land use activities in agricultural areas and rangelands based on principles of sustainability and recognizing the capability of the land to support those uses.'

The Department of Water is responsible for managing and protecting the State's water resources. As a general guide for streams draining into a water supply resource such as a reservoir, a minimum buffer width of 30 m is required for first and second order streams and 50 m for third order streams (WADOE 2005). Planted buffers should consist of native trees, shrubs and groundcover. Developments within buffers, including silviculture, may be permitted. Although riparian forestry activities on cleared farmland are not specifically mentioned in these guidelines, they could, if carefully planned, fall within the general intent. However, small plantings that do not constitute plantations do not necessarily need to go through an approval process. Riparian strip plantings only, where a farmer just wants to plant along a

watercourse could fall into this category, and although there appears to be no legislation or guidance document that encourages the practice, advice was received from the state contact that it could be done with commercial species and intent.

In general, plantation developments in WA need to be in accordance with The Code of Practice for Timber Plantations, published by the Forest Industries Federation of WA (FIFWA 2006). This code is not supported by legislation, but it provides a set of guidelines for plantation management. Because the code lacks legislative support, there is scope for discretionary application of regulations in relation to plantation management, and hence regulatory uncertainties remain. Several aspects of the code discourage farmers from considering the use of riparian forestry. For example, “Non planted buffers of six metres must be maintained from the edge of a watercourse” and it specifies that use of site preparation equipment in this zone should be avoided.

Review process

The WA code requires revision every five years or as required, and will be conducted by the FIFWA. The revision process includes input from committees, including experts, state government and industry groups.

Conclusions

While state government strategies generally encourage farm forestry as a means of obtaining environmental and commercial benefits from plantations, specific encouragement is lacking in these strategies for the use of riparian (stream-side) buffers that contain trees grown for commercial purposes, i.e. riparian forestry. State codes of forest practice generally prohibit or discourage harvesting of trees in streamside reserves or buffer zones, which is precisely where many farmers and managers in NRM regions are likely to first consider investing in watercourse protection by fencing out stock and planting trees.

This inconsistency between the codes of forest practice and commercially-driven farm forestry strategies could be addressed by changing the codes to include a provision that harvesting of trees in riparian buffers on cleared farmland would be permitted if they were managed carefully enough to achieve significant environmental benefits. Most codes indicate scope for revision, with a revision frequency of 5 years. During the next phase of revision for each code, I recommend consideration of issues relating to riparian forestry on cleared farmland as a means to improving environmental outcomes.

Acknowledgements

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