

# Chapter 13

## Private Native Forestry: River Red Gum

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### Introduction

Private native forestry in the Riverina mainly relates to River Red Gum (floodplain forests) box and cypress species. Although traditional native forestry has centred on products such as timber, fodder, honey and grazing, there is a growing interest in the use of forests for environmental services such as greenhouse gas mitigation, dryland salinity control, biodiversity enhancement and land repair.

Management outcomes may vary depending upon the productive capacity of the forests and the potential for traditional commercial and non-commercial values to be realised.

This chapter deals with the River Red Gum lands and their use for multiple use forestry.

### Background

River Red Gum (Red Gum) lands used for timber production need to be managed in conjunction with a range of other values such as flood mitigation, natural and cultural heritage, visual amenity, wildlife and native fish habitat and recreation. Under an adequately planned multiple use regime, it is possible to manage for these and other values (eg. grazing and apiary) in accord with the priorities determined by the private forest grower.

Active management of seasonal flooding for forest health and wetland dependent flora and fauna provides a unique dimension and challenge for the private floodplain forest manager who also needs to have an understanding of the link between river flows, forest flooding, forest ecology and production systems.

Timber production is currently the main commercial use of a significant proportion of private Red Gum forests in the Riverina. Timber values have long been recognised for their combination of natural feature appeal, strength, durability and workability. These have led to high demands for a range of products including furniture and heavy construction timbers from the better quality logs to fuelwood and charcoal obtained from residues or silvicultural thinnings. The full range of markets has led to relatively high levels of utilisation for well over 100 years.

Red Gum has several characteristics that enhance its value as a species managed for timber production. It regenerates well under natural conditions and grows at relatively favourable rates where there is good root access to water, producing high volumes per hectare. The monospecific nature of the forests means that competition from less productive species is absent or at a minimum.

The more productive stands (relatively homogenous units of forest) of Red Gum on private land are located where levee

banks have not excluded natural flooding or where active management for native forestry occurs as part of farm management with supplementary watering.

Scheduling of timber harvesting and/or silvicultural treatment should be purposeful and where possible, consistent with the stated objectives and strategies outlined in a forest management plan. Silvicultural practice within Red Gum should be consistent with the principles relevant to the 'very shade and competition intolerant' species group of eucalypts.

The Red Gum forests of the Riverina display a wide variation in stand structure and age in response to a lengthy period of disturbance connected to fire, flooding, grazing and timber extraction. Indeed the essential character of these forests derives from this history of disturbance and management intervention. However, such variation suggests the need for a tailored approach to future planning at the property or sub-catchment level in order to optimise multiple use benefits and to also ensure trees and stands are managed for their highest value end use.

## The planning process

Requirements to prepare a private native forest harvest plan for timber extraction or silvicultural activity will be ultimately governed by the prevailing native vegetation policy and legislation of the day. The following comments are provided as an incentive to private growers to undertake planning at the forest and stand level, rather than serve to mandate a particular planning methodology or prescriptive format.

**A Property Plan** (single or multiple landholdings) outlines management objectives for the Red Gum component within a property or group of properties under the same management regime. For

example, the timber production objective might be to optimise the non-declining yield or production of high quality logs over 60 centimetre diameter for sawn timber or veneer production. Other objectives might be to maintain a minimum number of hollow-bearing trees and a proportion of coarse woody debris on the ground for native fauna habitat. This plan should consider the floodplain environment and forest flooding as this underpins forest ecosystem sustainability. Native vegetation and other legislation relevant to private native forestry should be identified. A comprehensive map or equivalent representation showing the extent of Red Gum vegetation and major features such as streams and water bodies will assist in developing a timber harvest plan or silvicultural treatment plan.

**A Harvest Plan** (single or multiple landholdings) details site specific actions to achieve the forest management and timber production objectives outlined in the property plan and is designed to maintain or enhance the values of the forest. This plan may include, but not be limited to, the following:

- boundary demarcation to define the net harvest area and other boundaries including cadastral boundaries;
- conditions or restrictions derived from legislative approvals or policy and mention of any relevant codes or standards applicable to the activity;
- occupational Health and Safety requirements and evacuation plan;
- generic and/or site specific prescriptions (eg. habitat trees, riparian zone conditions);
- silvicultural treatments and spatial application of techniques appropriate for the stand;
- post-harvest stand parameters (eg. post harvest residual basal area or tree espacement);
- products list and sales/accounting systems applicable to product removal and sale;

- post-harvest compliance report if applicable (eg. content and timelines); and
- map detailing the harvest area and other features relevant to the activity (eg. roads and extraction routes);

**Harvest Plan Implementation** (single or multiple landholdings) involves the application of the Harvest Plan and any codes to achieve the desired outcomes. Two important components of implementation are:

- tree selection method (tree marker). This control ensures that trees designated for harvest will be in accord with the appropriate silvicultural treatment, which in turn determines the amount of timber removed under the plan. Tree marking may be for removal or retention depending upon the proportion of stems to be removed / retained within the stand. The practice may involve the physical marking of each tree or group of trees within a stand; and
- harvesting supervision, where a person is responsible for progressive implementation of the plan including compliance with harvesting prescriptions and any relevant standard or code applicable to the activity.

## **Silvicultural practice**

### **Regeneration harvests**

Regeneration harvests are designed to create optimum conditions for the creation of a new forest where it is no longer appropriate to continue thinning to redistribute growth onto better retained trees (see below). The timing and configuration of regeneration harvest units within the forest will normally reflect the mosaic of past disturbances and management interventions, which have produced the stimulus for regeneration in the past and accounts for

the present stand condition and age of the dominant trees.

Red Gum regenerates naturally from seed fall and is usually associated with ground disturbance and/or silt deposited in floods. Disturbance from floods, logging, grazing and fire provides an ideal seedbed, while the presence of leaf litter heaps appears to encourage foraging by surface roots while the tap-root penetrates the heavy soil. Widespread regeneration has generally been associated with the major floods across the Riverina. For instance the 1956 and 1974/75 floods produced extensive regeneration in the Murray region.

Regeneration will develop strongly where sufficient light is available and moisture competition from adjoining mature trees does not restrict the establishment of seedlings. Canopy openings of a size equivalent to at least three mature crowns are indicated to allow effective regeneration and potentially overcome moisture competition from adjacent mature or maturing trees.

Care should be taken to ensure grazing pressure does not result in damage to young seedlings.

In reality the timing and size (extent) of regeneration harvests are generally governed by the principles of the Australian Group Selection System, which recognises the need to create adequate openings consistent with conserving aesthetics, improving structural diversity of the forest and maintaining timber supply.

### **Thinning or intermediate harvests**

The benefits for timber production from regrowth thinning have been well understood since the late 1800's. It is considered that spacing of regrowth trees should commence when the dominant and better co-dominant trees in the stand

are about 20 to 30 centimetres in diameter, by which time their apical dominance is established. (Thinning before this stage will result in loss of apical dominance with a high proportion of cellulose production going into branches rather than the main stem, which carries the highest end value products).

As a guide, where even-aged Red Gum regrowth stands are being thinned, the average spacing of the future crop trees retained should be governed on the basis of retaining a potentially useful basal area of about 16 m<sup>2</sup> per hectare. This is equivalent to an average spacing in metres, of 0.25 D where D is the diameter breast height over bark (d.b.h.o.b.) measured in centimetres. (Breast height is deemed to be a distance of 1.3 metres up the stem from the ground)

For example, if the retained future crop trees have an average d.b.h.o.b. in the range 30 to 35 centimetres, the average spacing would be in the range 7.5 to 9.0 metres. This might apply to dense regrowth stands dating from the 1974/75 floods. Similarly, for an older stand where the future crop trees have an average d.b.h.o.b. in the range 40 to 45 centimetres, the average spacing would be in the range 10 to 12 metres. This might apply to regrowth stands dating from the 1956 floods, depending upon whether the stand was previously thinned.

As always, in deciding which trees should be retained to grow to higher value logs, this guide should be applied together with individual tree attributes such as position in the stand (dominance), crown vigour and health and form (shape and taper of the stem).

Once trees have been selected for retention to grow to higher value logs, it is important to eliminate or at least minimise damage to these trees. Good

directional felling techniques and care taken during snigging the felled tree (log) from the stump to the log landing will help minimise any damage.

## Timber products

Red Gum logs produced from sustainably managed private native forests can range from the highest quality veneer and sawlogs suitable for the production of furniture, through a number of intermediate log grades suitable for durable green sawn product, to residues salvaged from sawlog operations and silvicultural thinnings. The latter category has traditionally been used for paddleboat steamer fuel, domestic and industrial fuelwood and charcoal, and also used for cooking.

As always the markets for timber products can vary over time and private forest growers need to tailor their management decisions with an eye to current and developing markets.

## Definitions

Australian Group Selection System: A silvicultural system where commercially mature trees are selected for harvesting to ensure sufficient canopy openings are created to enable effective regeneration. (*The practice is suited to eucalypt forests in Australia where adequate openings need to be created consistent with conserving aesthetics, improving structural diversity of the forest and maintaining timber supply*).

Apical dominance: A growth habit of trees where the active apical (top) growth buds dominate the lateral growth buds to get increased light, resulting in vertical or upwards growth suppressing lateral or outwards growth. (*It is important that apical dominance is established prior to conducting a first thinning in eucalypt forests where the goal is to optimise*

*biomass production into the single main stem for timber production values).*

**Basal Area:** The sectional area of a tree at breast height, or in the case of a nominated category, class, or stand of trees, the summation of the sectional area of all trees at their breast height in that category, class or stand of trees. *(In Australia it is usually expressed as square metres per hectare eg thinning to retain a residual stand basal area of 16m<sup>2</sup> per hectare).*

**Codominant Tree:** Trees with crowns extending above the general level of the crown cover and receiving full light from above but comparatively little from the sides. *(Thinning from below should result in a significant proportion (perhaps 50%) of trees in this crown classification being retained to grow to higher value products or for other purposes).*

**Configuration:** The spatial arrangement or distribution of a feature. *(For instance the spatial arrangement or distribution of regeneration harvest units across the forest).*

**Directional Felling:** A tree felling technique where the placement and sequence of cuts made in the base of the tree ensures the tree will fall in a specified direction in a predictable and safe manner. *(With mechanical harvesting it may also be possible to further improve directional precision by grasping the tree and applying a mechanical and controlled force in the direction of felling).*

**Dominant Tree:** Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side. *(Thinning operations directed at removing the less desirable stems should result in the majority of trees with this crown classification being retained to grow to a*

*larger diameter higher value log for timber production or, alternatively, be encouraged to develop large broad spreading crowns for other values).*

**Espacement:** The spatial arrangement of a feature or event. Tree espacement refers to the average spacing (distance) between trees in the stand. *(In the case of a harvest or silvicultural treatment, a post-harvest tree espacement may be prescribed to ensure sufficient good young trees are retained at the correct spacing to optimise the growth potential of the site).*

**Harvesting Prescriptions:** Specifications or conditions that govern harvesting. *(Prescriptions may relate to stand parameters such as residual stand basal area or the retention of a specified number of hollow bearing trees, where they exist. Harvesting prescriptions are normally written into a harvest plan or silvicultural treatment plan, where a plan is required).*

**Log Landing:** A site, normally located in the harvest area, where logs that are produced during harvesting are snigged for servicing, segregation and loading onto trucks for transport to a timber processing plant.

**Monospecific:** Single species such as in a stand of a single species of Red Gum.

**Silviculture:** Tending the forest through the management and manipulation of trees and stands of trees to achieve the goals of the forest manager. It has its foundation in the natural sciences and deals with the laws that govern the growth and development of single trees and the forest as a biological unit.

**Snigging:** The mechanical dragging by grapple, chain or rope logs that are produced in the harvesting activity to the log landing.

## **References and further reading**

Carron, L.T. (1968) *An Outline of Forest Mensuration with Special Reference to Australia.*

Forestry Commission of NSW (1985) *Management Plan for Murray Management Area.* Forestry Commission of N.S.W. Sydney.

Institute of Foresters of Australia/State Forests of NSW/Offices of Forestry Information. *Silviculture Notes for N.S.W. River Red Gum.*

Soil Conservation Service of NSW (1990) *Managing Our River Red Gums.*