

Economic Aspects of Native Regrowth Forestry on Farms in the New England Region

Introduction

This leaflet provides information on the economic aspects of producing timber from privately-owned native forests in the New England region.

The management of suitable privately-owned native forests for commercial timber production could provide an income diversification option for a number of landholders in the New England region, and serves as a lower cost option to plantation development.

At the time of writing, New South Wales land management legislation, notably the Native Vegetation Conservation Act, specifically allows for tree thinning and felling for commercial timber production on privately-owned land under the *Private Native Forestry Exemption* carried through from the State Environmental Planning Policy No. 46 (if carried out on non-State Protected Land). There are some conditions attached, and it is recommended (forming part of good forest management practice) that landholders should carry a resource inventory and forest management planning exercise prior to commencing any silvicultural or harvesting operations.

However, it is possible that the current legislation governing private native forest management may soon change, and that the *Private Native Forestry* exemption will be removed or modified. This may result in the requirement of an assessment and application process for silvicultural and operational management of private native forests, along with the implementation of a planning process such as that suggested in the Department of Land and Water Conservation's 'Best Operating Standard' for Private Native Forestry. This would involve the development of a long-term forestry plan meeting the principles of Ecologically Sustainable Forest Management (ESFM). The Regional Vegetation Management Plan currently being developed for the region may also have an impact on the requirements for carrying out private native forest management and production.

There are a number of organisations or forestry consultants that are available to assist you with the forestry planning process. It is recommended that you enlist professional help in this matter to ensure you gain a clear insight into the legislative requirements, as well as realising the productivity benefits achieved from carrying out the best silvicultural management practices.

The current situation and future potential in the New England

The largest forest resource in the New England region is existing regrowth native forest. Much of this forest is on private land. A recent study carried out by the New England – North West Regional Development Board estimated that there is currently over 154,000ha of potentially productive forest situated on private land within an approximate 100km of Walcha alone. This represents an estimated potential annual yield of 105-309,000m³ of sawlog and 140-387,000 m³ of lower grade products (depending on the degree of management employed). This is a valuable resource and must be properly managed to ensure ongoing sustainable production.

Western portions of the region contain significant quantities of cypress pine. Much of this resource is unmanaged and represents an impediment to

agricultural production, rather than being viewed as a valuable resource. This situation might be reversed with the implementation of sustainable timber management regimes and the development of market outlets.

The majority of small sawmills in the region (processing between 800-4,000 m³ of logs per annum) rely entirely on private property native forest resource. Already, the reduction in hardwoods available from NSW State Forests as a result of Regional Forests Agreements has prompted mills using State Forests resource to seek more private property timber.

Popular New England species sought by local mills include silvertop stringybark (*Eucalyptus laevopinea*), New England stringybark

(*E. caliginosa*), red stringybark (*E. macroryncha*), New England blackbutt (*E. campanulata* and *E. andrewsii*), ribbon gum (*E. viminalis*), Sydney blue gum (*E. saligna*), tallwood (*E. microcorrays*) and brush box (*Lophostomon confertus*).

Native hardwood forest growth rates vary significantly across the region. Unmanaged forest

may have a mean annual increment (MAI) of just 0.25-0.5 m³/ha/year. However with proper management, this might be increased to 3-5 m³/ha/year on the best sites. Growth and yield potential on the eastern fall is generally higher than in the central and western parts of the region due to preferred soil types and higher rainfall.

Native forest silvicultural costs

Commercial timber production from existing native forests requires active forest management to maintain growth and maximise wood production potential. The aim is to manage the forest with an uneven-aged forest structure with trees ranging from seedlings to over mature trees with hollows. As the forest is progressively harvested over a number of harvesting cycles, it regenerates maintaining that structure and allowing on-going growth and production.

Silvicultural operations include culling, thinning and harvesting. This usually entails non-commercial thinning of the forest (often referred to as thinning to waste) by removing poorly formed or suppressed trees to allow vigorous growth in the remaining (crop) trees. The operation is non-commercial because culled trees are generally not of sufficient size or form to be sold for timber. It may take several cycles to replace slow growing or poorly formed trees with ones that can grow high value products.

Regrowth forests can be thinned by mechanical means (brushcutters, clearing saws) or chemical (eg. Tordon-Ax™, Steminjector™). The costs of these operations can vary significantly depending on:

- Stocking rate - costs increase as more stems are removed;
- The size of the trees to be removed; and
- Ease of site access including the amount of timber debris on the ground.

The initial tree spacing operation is likely to incur the most significant silvicultural cost in a poorly managed native forest. While dense eucalypt forests in other regions may require additional commercial thinning, this is less likely for New England eucalypts. The main task will be controlling regrowth.

Cypress pine will usually require a commercial thin some 50 years after initial spacing. The trees are removed at around 18-24cm in diameter at breast height (130cm above ground level). These will attract a royalty in the order of \$18/m³. Typically around 5m³ will be removed at this thinning providing a gross return of \$90/ha.

Costs in dense Victorian re-growth eucalypt forests (stocking rate of 16,000 stems/ha) range from \$350-1,700 per hectare. Costs in New England eucalypt forests are likely to be at the lower end of this range as typical stocking rates are in the order of 300-600 stems per hectare.

White cypress (*Callitris glaucophylla*) forests can reach a stocking rate of 10,000-20,000 in unmanaged areas. This density often results in stand 'lock up', whereby none of the trees are actively growing rendering the land virtually useless for both agricultural and timber production. State Forests of New South Wales figures have indicated that thinning costs of around \$200-400/ha using brushcutters and chainsaws are typical for the New England region. A spacing of about 6 to 8 metres is recommended.

In sparse stands of native eucalypt forest, a selective logging operation may be sufficient to generate the desired tree growth. If the logging operation produces commercial timber, then it essentially becomes a commercial thinning operation.

It should be noted that most forestry silvicultural operations are dangerous, even for experienced operators. There are a number of safety, training and insurance issues that must be considered by landholders attempting to carry out their own operations, and it may ultimately be deemed more appropriate to hire contractors to carry out all or some of the work.

Harvest related costs

The costs of the harvesting operation are influenced by factors such as site access, total volume of timber being harvested, roading costs and distance to the processing plant. Harvesting operations are becoming increasingly mechanised.

The landholder may choose to be paid a stumpage price for their trees (a price for the standing tree). In arriving at this price, the purchaser will take into account all their harvest-related costs (falling, snagging, merchandising, loading and haulage).

Alternatively, the landholder may carry out some or all of the components of the harvesting operation themselves, and may even carry out some primary processing on-farm if they have access to saw-milling or processing equipment, and sell green-sawn timber to the market. Again, there are a number of safety issues to consider if the work is to be carried out by the landholder.

Falling, snigging and log loading costs can range from \$15 to \$25 per cubic metre. Haulage costs are influenced by the distance to the sawmill, with costs of around \$5 to \$20 per cubic metre being typical.

There are a number of less obvious costs that also need to be considered, including the costs associated with professional advice (eg. silvicultural consultants, management plans, harvesting plans), insurance, the cost of land out of production and the cost of finding a market.

It is likely that a yield of 100m³ of logs is the minimum required before a harvesting contractor could warrant moving equipment onto the site, and an area of 20 hectares is probably the minimum size for private native forestry to be viable.

Timber yields & returns

The table below presents indicative wood yields and financial returns for a number of different scenarios; 1) unmanaged native eucalypt forest; 2) managed native eucalypt forest; 3) managed eucalypt native forest that is harvested and milled on farm then sold as green boards to a mill for further processing; and 4) managed native cypress pine forests.

An alternative to selling timber at stumpage prices is to mill timber on-farm and sell sawn timber. A number of New England landholders have adopted

this option using their own on-farm sawmilling facilities or making use of mobile sawmills.

Typical operating costs for an on-farm sawmill are in the order of \$90-100/m³ of log sawn. Using the services of a mobile sawmiller costs around \$115/m³ for sawing only, or \$300/m³ where the mobile mill operator performs the cut/snig operation in addition to sawing. Sawn structural timber and board prices of \$350-475/m³ are realistic.

Situation	Indicative yields	Indicative return (\$/ha)	Comments
1. Unmanaged existing native eucalypt forest	5-10m ³ /ha of sawlogs with a 20-40 year cutting cycle	\$50-300/ha every 20-40 years at stumpage rates of \$10-30/m ³	Hardwood forests in the west of the region will produce lower yields than in the east.
2. Managed existing native eucalypt forest:	From 10 to 35 m ³ /ha of sawlogs & pulp with a 10-15 year cutting cycle	\$100-1050/ha every 10-15 years at stumpage rates of \$10-30/m ³	Typical MAI is around 0.25-0.5 m ³ /ha/year.
3. Selling green sawn boards milled on-farm*	Yield of 5m ³ /ha in unmanaged forest	Net <u>annual</u> return of \$25/ha for unmanaged forest	Forests in the east of the region are more productive. Typical MAI is around 0.5-1.0 m ³ /ha/year without management.
	Yield of 35m ³ /ha in managed forest	Net <u>annual</u> return of \$110-160/ha for managed forest (depending on access to a pulp wood market)	Higher stumpages are often paid logs suited to peeling in plywood/veneer production.
			Management of native forest (ie. thinning) can significantly improve growth & timber yields.

4. Managed cypress forests

Commercial thinning 45 years after spacing to 6-8 metre centres yielding 5m³/ha

\$90/ha 45 years after spacing

Commercial thinning timber attracts a stumpage in the order of \$18m³ for logs 18-24cm in diameter.

Final harvest at 70-100 years of age yielding up to 30m³/ha sawlogs

Up to \$1000/ha every 70-100 years

Typical stumpage rates are \$18-36/ m³ for logs 26cm+ diameter. Higher prices are paid for timber from land which has easy access.

*Assumes harvest cost of \$20-25/m³, milling cost of \$100/m³, thinning cost of \$100/ha and a 250km haul at \$0.14/m³/km

Profitability

It is difficult to be prescriptive about the returns from the management of private native forest for timber production. There are a range of factors which should be considered including:

- A key advantage of harvesting commercial timber from existing native forest is that, unlike plantations, cash flows can be realised much earlier. Many native forests will contain trees which are already of commercial size and can be harvested immediately;
- Growth rates and management costs can vary dramatically depending on factors such as tree species mix and site characteristics. Unlike a plantation monoculture, there is scope for considerable variation in a mixed species native forest stand;
- Native forest management can have positive commercial effects on other farm enterprises. For example, a cypress forest at lock-up density has no grazing potential since canopy closure precludes pasture growth. However, spacing of this stand may provide potential for *both* additional grazing and commercial timber production. In fact, recent research indicates that

the costs of thinning are only justified if the joint benefits of timber sales, additional grazing and erosion control are achieved;

- The scope for processing timber on-farm, particularly for hardwood species. There may be opportunities for landholders to supply green-sawn timber to processing facilities for further value-adding;
- Current cypress pine management practices may see up to 30 m³ of sawlogs and 15 m³ of thinnings produced per hectare. However this can only be achieved every 70-100 years, compared to a 10-15 year cutting cycle for hardwoods on the eastern fall.

Ultimately, site productivity, species, current forest condition, existing standing volumes, accessibility to the forest and distance to the market are key determinants of profitability. In the near future, the costs of implementing legislative requirements may also affect the profitability of managing private native forests.

New England Case Studies

The Centre for Agricultural & Regional Economics Pty Ltd have recently completed a study of the economics of existing timber management on four case study farms in the region. One of these farms has a significant area of cypress pine which requires management. The other three have predominantly eucalypt hardwood forests with varying degrees of potential for timber production. The general findings from this study were:

- Where existing forest management (spacing) costs are in the order of \$200/ha and yields of

just 5-10m³/ha are be achieved, managing forests and selling the timber to local mills cannot be justified financially where stumpage prices are in the order of \$18-25/m³. However, this does not preclude selling existing timber at these stumpage rates where no spacing has been undertaken - this basically amounts to an opportunistic logging of unmanaged forest. It is also important to note that much higher yields may result from spacing in the higher rainfall eastern parts of the region;

- It is likely that spacing costs, particularly in some hardwood forests, would be considerably lower than \$200/ha (perhaps less than \$100/ha). Where this is the case, active management is feasible from a financial viewpoint;
- The ability to increase livestock carrying capacity in thinned forests is an important economic driver in native forest management;
- Revenues from existing timber management fall well short of covering the costs of plantation establishment when sold at stumpage rates;
- Value-adding timber on-farm (eg. selling green sawn or kiln dried timber as opposed to taking stumpage prices) greatly enhanced the financial performance of forest management. However, landholders require both timber processing and marketing skills to compete effectively with existing sawmills.

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DISCLAIMER

There are a number of variables that affect commercial timber production and each individual situation will differ. The figures presented in the leaflet are intended to present a general picture of potential growth, production and financial scenarios associated with commercial timber production on farms, and do not necessarily represent actual realised production or returns. It is recommended that prospective growers and producers seek professional advice before commencing a forestry program on their farm.