Executive Summary

Wood Production Options Case Studies

for

Carbon Plantations –Extending R&D to best management practices for carbon sequestration, wood production and new investment opportunities on private land in Tasmania.

November, 2010

Private Forests Tasmania

Livingston Natural Resource Services

Overview

This series of case studies examines different ways farmers can manage their plantations to grow wood for industry. Each study estimates the volumes and value of different wood products that can be produced by different management regimes and includes production costs and financial returns. This executive summary does not report on individual case studies for which the detail can be found in the full report.

Modelling

Wood production estimates were undertaken with Farm Forestry Toolbox and based on growth rates as measured on each site at ages 5-12 years. Predictions of regime length (years to harvest), and product volumes and financial returns to grower were calculated. Financial analysis of the regimes included Net Present Values, Internal Rates of Return and Annual Equivalent Value.

Net Present Value (NPV) converts a series of future cash flows into a single value to allow alternative investment options to be compared - this is essentially a benefit-cost analysis.

Internal Rate of Return (IRR) - represents the expected return (expressed as a percentage) on the initial investment, averaged over the life of the project.

The Annual Equivalent Value (AEV) gives the expected annual return, averaged over the life of the project and expressed in present-day prices, enabling direct comparisons to be made between projects with different durations

Sites

The case study sites were selected to represent the broad range of growth potential for plantations across north and north east Tasmania from low rainfall (620mm)- low fertility through to high rainfall (1200mm)- high fertility sites. The four properties on which the case studies are located also represent a range of enterprises including cattle and sheep grazing, dairy and cropping. All case study sites are based on plantations of around 10 hectares that are at least six years old, with four *Pinus radiata* and one *Eucalyptus nitens* plantations evaluated.

Regimes

Four management regimes were modelled for wood production on each of the sites. These were chosen as the most commonly applied regimes for plantations in Tasmania and are shown in Table 1, with a brief description of the objective and silviculture. A short rotation pulpwood regime was included for eucalypt plantations only. An additional three regimes were modelled for use in carbon calculations, including short and long rotations (100 years) but not used in financial analysis.

Table 1: Regimes

Regime	Objective
Clearwood	To produce a 6m pruned log from trees with an average diameter breast height over bark (DBHob) of 60cm in the shortest possible time. Pruning and non commercial thinning undertaken
Clearwood 2	To produce a 6m pruned log from trees with an average diameter over bark (DBHob) of 60cm, with a revenue from pulpwood thinning. Pruning and commercial thinning undertaken
Knotty Sawlog	To produce a final crop of unpruned trees with small knots with an average diameter of 45 cm. Commercial thinning, no pruning undertaken
Unthinned Knotty Sawlog	To produce a final crop of unpruned trees on sites where commercial thinning is not economic or markets are unavailable. Lower grade logs with larger knots are produced, but input costs are minimised. . No Pruning or thinning undertaken

Stumpage Rates

Stumpage rates (the price paid to farmers for standing timber) were derived from industry sources. They took into account harvesting type and distance to market based on an expected Mill Door price at the closest point of sale. Regimes with high value products (veneer and pruned logs) are less susceptible to fluctuations in costs for harvesting and haulage costs, they are also more likely to be saleable from small plantation areas

Table 2: Stumpage as a percentage of Mill Door Price (Radiata Pine)

Product	Range from	Range to	Average
Veneer	66%	74%	**70%**
Pruned Sawlog	72%	77%	**74%**
Knotty Sawlog	57%	64%	**59%**
Small Sawlog	42%	53%	**48%**
Pulp	8%	30%	**17%**

Figure 1 shows the effect of distance to market on stumpage rates for Radiata Pine logs. Distance to market can influence regime selection for different sites which in this study varied between 20 and 250 kilometres.

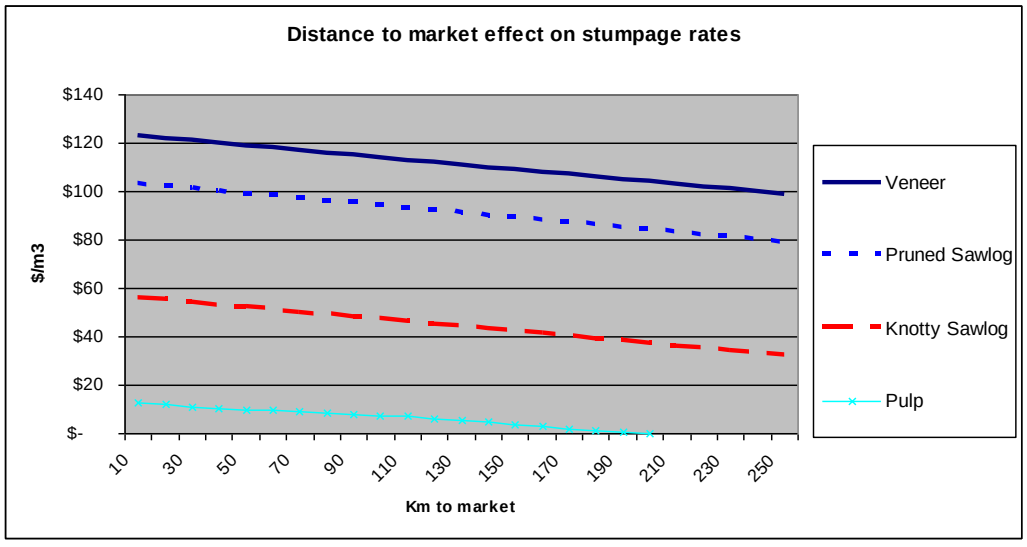

Figure 1: Effect on Distance to Market on Stumpage

Outcomes

- The profitability of all regimes increases with site productivity. On low productivity sites, very long regimes are needed to grow wood products to preferred market sizes and to make the regimes more viable, a comprise must be made in earlier harvest with smaller log sizes, resulting in lower returns.

- Distance to market has a significant effect on stumpage rates and therefore can influence the profitability of regimes independent of site productivity

- Internal Rates of Return varied by 2-3% across regimes on all sites, with the lowest 8% on low quality sites and the highest 11.5% on high quality sites.

- Internal Rates of Return (IRR) varied by 2-3% across regimes on all sites, with the lowest 8% on low quality sites and the highest 11.5% on high quality sites.

- Delaying thinning in Clearwood regimes to produce a commercial harvest on all sites had marginal effect (<0.5%) on Internal Rates of Return. Annual Equivalent Value (AEV) was reduced by 17- 24%.

- Thinning to produce knotty sawlog reduced regimes lengths by 6 years (low productivity sites) up to 11 years (high productivity sites) compared to unthinned stands. IRR increased by 2-3% over all other regimes on all sites. AEV increased by between 8% and 17% over unthinned stands.

- Clearwood with non-commercial thinning decreased IRR by 2-3%. Here, the AEV was highest across all sites with AEV increasing by 42-57%.

- Choices of regimes must take into account a variety of factors, such as site productivity, distance to market, and expected time of return on investment. Pruning regimes, while on paper may result in lower economic returns, can increase the likelihood of sales of low value from small plantation areas.