

THE ECONOMICS OF INTENSIVE FOREST MANAGEMENT: A STAND LEVEL ANALYSIS FOR THE ROMEO MALETTE FOREST IN ONTARIO

Forestry Research Partnership Project No. 140-105

Aim

There has been a renewed interest in the potential for increasing commercial timber yields through intensive forest management (IFM) on Crown lands. This project examines the economics of IFM at the stand level. The representative stands, based on standard forest units, are PJ1 (jack pine), SB1 (black spruce), and SP1 (black spruce, jack pine). This project defines seven different levels of forest management based on the level of silvicultural expenditures, in the hopes that a greater volume of lumber can be produced from a smaller land base, which would leave more hectares available as natural habitat. This project analysed IFM returns strictly in terms of commercial forestry.

Approach

Investments made today to establish a stand and the investments made to manage and maintain that stand over its lifetime are compounded forward to the harvest date and are applied against the revenues realised at that harvest date to determine if the investment was, in an



overall sense, economically worthwhile. This project uses two different methods: the Faustmann approach, which is a traditional discounted cash flow analysis over multiple forest rotations; and the real options approach, which assumes that the decision to harvest a stand of trees is based on maximizing economic value, not wood volume, and that the manager has discretion over the harvest date. A significant drawback of the Faustmann approach is the assumption that future prices and costs are known with certainty and that management does not have the ability to react optimally to fluctuations in prices. In contrast, the real options



approach can take explicit account of different management options, such as the ability to delay an investment to wait for more favourable circumstances. Unlike the Faustmann approach, the real options approach does not yield an optimal harvesting time that is known with certainty at the beginning of a rotation. Rather, the optimal harvesting time will depend on prices in a given year, and cannot be known in advance. The returns using the real options approach are dependent on the assumption that future lumber prices will be volatile.

Tree Tip

The year with the maximum net present value is the optimal harvesting age from the Faustmann perspective. The basic and intensive treatments involve major increases in silvicultural expenditures. The resulting increase in merchantable volume is not sufficient to offset these expenditures, resulting in reduced net

present values compared to the extensive and basic regimes. The results of the real options approach include a critical price estimate for any given year: harvesting should take place if prices meet or exceed that critical price. The difference between the two approaches reflects the ability to take advantage of price volatility around the mean. Both the Faustmann and the real options approaches indicate that the extra expenditures incurred in the basic and intensive regimes cannot be justified by the additional revenue that will accrue from harvesting the trees. It would be worthwhile for the firm to undertake intensive management, if as a result it is given the right to harvest the existing inventory. The firm would, however, make the largest return if it could achieve an increased allowable cut without having to make the investment in intensive management.

Team

- Margaret Insley, Ph.D., University of Waterloo, project leader
- Kimberly Rollins, University of Nevada, project partner
- Glenn Fox, University of Guelph, project partner
- Al Stinson, Canadian Ecology Centre - Forestry Research Partnership, project facilitator
- Wayne Bell, Ontario Ministry of Natural Resources, project partner
- Paul Krabbe, Tembec Inc, project partner

For more detailed information, please visit:

http://forestresearch.ca/partnership_projects/sustainability/140-105.htm

