Reforestation as an Investment: Does It Pay?

Many investment analysts consider reforestation one of the best long-term investment opportunities available to landowners. This conclusion is based on the appreciation of timber products over the past 50 years. On the basis of trends, analysts confidently make the following predictions:

- Prices paid to landowners nationally for softwood sawtimber and quality hardwood sawtimber will rise at a rate at least equal to that of inflation.
- The price paid for standing timber may rise more rapidly in the Southeast than across the nation because of greater forest industry activity in that region. Such an increase may produce even greater competition for timber products such as pulpwood and sawtimber. Companies are looking to the Southeast because its capacity to grow timber in a short time exceeds that of other areas of the United States.

Although the future looks particularly promising for timber investments, foresters are concerned because many nonindustrial, private woodlot owners do not adequately reforest harvested acres. These private owners, who own or control close to 70 percent of the South's commercial timberland, are losing a tremendous opportunity to produce future timber income.

Many landowners regularly invest in other long-term investments such as Individual Retirement Accounts (IRAs), stocks, and bonds, but forego the likely chance to earn high returns from timber production. Tax incentives, cost sharing programs, and increased property value are added benefits of reforestation.

Information Needed to Analyze A Reforestation Investment

To analyze the potential benefits of reforestation, you will need four items of information:

1. The productive capability of the area to be planted. A forester can estimate the "Site Index" (SI). SI is the total height to which dominant trees of a given species will grow on a given site by some index age, usually 25 or 50 years. For example, if the site index for a particular site is 70 at 50 years for loblolly pine, foresters expect loblolly seedlings planted on that site today to be 70 feet tall in 50 years. For additional information on site index see Woodland Owner Note 7, Forest Soils and Site Index.

Once the forester determines the site index, future timber yields can be predicted. Yields will vary according to the number of trees per acre, frequency and intensity of thinnings, and the expected or desired rotation age.

2. The costs of site preparation and reforestation. Reforestation costs depend on the condition of the site to be reforested. Costs to prepare the site may range from none to more than $200 per acre. If the site is free of competing vegetation, no preparation may be necessary. This is...
occasionally the case if the area has been completely harvested or is an old field. Site preparation costs increase to the upper limit as the amount of competing vegetation increases and will be greater if the site requires draining, ditching, bedding or fertilization.

The costs of replanting or reseeding normally will average $70 per acre. There is no cost if natural seeding has adequately restocked the area with seedlings of a desirable tree species.

3. **The amount and frequency of management activities required to maintain and protect a vigorous stand.** Landowners may periodically encounter such costs as prescribed burning, boundary line maintenance, fire line construction and maintenance, and insect or disease protection. These costs normally will not exceed $5 per acre per year.

4. **An estimate of the future value of harvested timber products.** Future timber value can be projected by increasing the present timber price to reflect the expected increase in timber prices over time. Although stumpage prices will fluctuate in the short term, real sawtimber prices (in excess of inflation) may increase over the long run. Trends indicate that historically, sawtimber prices have increased more than inflation. On the other hand, pulpwood prices in many areas of the Southeast have not kept pace with inflation. Increased market competition, however, is improving this performance.

### Examples: Analyzing a Reforestation Investment

The costs and returns from reforesting one acre to loblolly pine are used in two examples to illustrate a reforestation investment.

Several definitions may be helpful to understand and interpret the examples:

**Net Present Value (NPV)** is the present (today's) value of expected future returns minus the present value of expected future costs. Investments with a positive NPV yield a higher return than the interest rate used in discounting future returns minus costs. When comparing investments, the one with the highest NPV (assuming the same discount rate) is the more desirable.

**Net Annual Equivalent (NAE)** is the conversion of NPV to an equal annual amount over the life of the investment.

**Return On Investment (ROI)** is the internal annual rate of return of an investment. It is the compound interest rate that equates the present value of future incomes with the present value of future costs. An investment is acceptable if the ROI equals or exceeds the minimum acceptable rate of return. In choosing between two investments, the investment with the higher ROI is preferred.

A basic assumption for both examples is that the current stumpage price is $245 per thousand board feet of sawtimber, $16.08 per cord for pine pulpwood, and $60.87 per cord for pine chip and saw. For both examples it is first assumed that sawtimber and chip and saw prices will increase one percent annually; the computations are then repeated assuming prices remain constant. Pulpwood prices are assumed to remain the same in all examples.

For Example 1, total site preparation and reforestation costs are assumed to be $165 per acre. Cost sharing will reimburse the owner for 40 percent of that cost; the landowner can also claim a 10 percent investment tax credit and can write off 95 percent of the total cost as amortized deductions over 84 months. These benefits reduce the out-of-pocket cost of reforestation to $47.51 per acre (assuming a 28 percent marginal tax rate and discounting future tax savings at a seven percent annual rate).

For Example 2, the total cost of reforestation is assumed to be $65 per acre. This rate would be realistic if a good, clean harvest has left the area clear of debris and no site preparation is therefore required. An even lower reforestation cost is possible if a clean harvest is done at the proper time in a good seed year. After cost-sharing reimbursement and tax incentives, the out-of-pocket cost for Example 2 is $18.73 per acre.

#### Example 1. Annual after-tax return on $165 investment for loblolly pine.

<table>
<thead>
<tr>
<th>Site Index at 25 Years</th>
<th>Sawtimber Price Increase</th>
<th>No Sawtimber Price Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Net Present Value</td>
<td>Net Annual Equivalent</td>
</tr>
<tr>
<td>50</td>
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<td>$13.79</td>
</tr>
<tr>
<td>60</td>
<td>491</td>
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<td>65</td>
<td>678</td>
<td>36.31</td>
</tr>
<tr>
<td>70</td>
<td>867</td>
<td>46.47</td>
</tr>
</tbody>
</table>

#### Example 2. Annual after-tax return on $65 investment for loblolly pine.

<table>
<thead>
<tr>
<th>Site Index at 25 Years</th>
<th>Sawtimber Price Increase</th>
<th>No Sawtimber Price Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Net Present Value</td>
<td>Net Annual Equivalent</td>
</tr>
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<tr>
<td>65</td>
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<tr>
<td>70</td>
<td>895</td>
<td>47.95</td>
</tr>
</tbody>
</table>
Other assumptions for both examples are that:

1. All incomes are pre-tax.
2. After-tax management costs are $2 per acre per year.
3. The rotation age for loblolly pine is 35 years, assuming 350 trees per acre initially with no thinnings for pulpwood.
4. To calculate net present value (NPV) and net annual equivalent (NAE), future incomes are discounted to the present at a four percent annual rate, approximating the real rate of return to productive investments for the past 40 years.

To assess the value of forestry investments, compare returns to alternative investment opportunities. Returns will vary with soil quality, length of growing period, investment and management strategies, market competition, tax bracket, and tree species. The examples given here assume zero inflation and thus reflect real rather than inflated returns. Nominal rates of return (including inflation) are approximated by adding the inflation rate to these real rates of return.

**Summary**

In making investments, people forego present consumption in the hope of generating a greater future income. For an investment to be worthwhile, the present value of estimated future returns must exceed investment costs. A prudent investor will weigh alternative opportunities and choose one that yields the greatest return, allowing for risk. Risks associated with forestry investments include devastation of timber by insects, diseases, and wildfires. Proper timber management greatly reduces these risks by fostering vigorous protected timber stands.

This publication illustrates that reforestation can be an excellent long-term investment even using very conservative timber price and management assumptions. Forest landowners should consider soil quality, tree species, local markets, costs, and anticipated yields before investing in reforestation or timber stand management. For more information and help in evaluating a particular timber investment opportunity, contact your County Cooperative Extension Service Agent, local Forest Service Office, or a professional forester.

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