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Timber Basis Decision Model

Documentation for an online calculator to aid in
federal timber tax-related decisions



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Legal Disclaimer

This publication is intended to assist forest landowners and managers with the tax treatment of timber investments. Given the frequency of changes in federal and state tax laws and regulations, of necessity, the information contained in this publication cannot be expected to be completely current. The information and decision model contained herein represents a good faith effort to present a decision model to help landowners better understand the financial implications of determining the basis allocation. Nevertheless, this publication is not responsible for the information or advice provided herein as it may affect the specific tax consequences to an individual taxpayer, which depends on many other facts and circumstances. This publication does not provide legal, tax or accounting advice; the information provided is intended to be general in nature; and readers are strongly encouraged to consult their own professional tax, accounting and legal advisors on individual tax matters. This disclaimer was modified from timbertax.org/disclaimer, accessed Nov 24, 2014

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Executive Summary

Establishing a timber basis can reduce a landowner's tax liability when timber¹ is sold. However, there are costs associated with establishing a timber basis; specifically, a timber and land appraisal² is necessary to determine the fair market value (FMV) of the timber and non-timber assets.

The timber basis decision model is found at extension.unh.edu/timber-basis. The timber basis decision model is a calculator with a simple set of fields that a landowner can input, with the help of a forester, to determine if there is a financial benefit to establishing a timber basis (i.e. more money is generated in tax savings than the costs to get it established).³ A timber basis tends to be most beneficial to forest landowners who have a robust timber resource and plan to harvest a moderate volume of timber in the near term. The financial incentives can be more pronounced for recently inherited property. This model is not structured to address gifted property.

This decision model is based on the assumptions of the user and answers a narrow question—"Does spending the money necessary to establish a timber basis result in a financial benefit to a forest landowner?" The answer should not be the sole determinant in management decisions. Timber appraisals may be packaged with forest stewardship plans providing educational and planning benefits in addition to tax incentives.⁴ Tax implications of harvest revenue are one of many considerations when managing land; as such, landowners should be careful not to manage their property for tax benefits exclusively if it is destructive to the long-term financial returns of their forestland.

Using this model in its proper context can provide quantitative data that will aid forest landowners in federal timber tax related decisions. It is intended to reduce complexity around a complicated topic; there are many additional resources that may be required to fully understand federal timber income tax treatment options. Additional resources are provided on the National Timber Tax website (timbertax.org).

¹ Timber is defined as "standing trees of species suitable for wood products." from *Forest Landowners' Guide to the Federal Income Tax*, Agriculture Handbook No 731, issued February 2013.

² Throughout this publication, we use the term land appraisal to mean fair market value (FMV) of land (non-timber) assets; in its simplest form this is raw land. Alternatively, it can include additional assets such as a house, etc.

³ We use the term "benefits of establishing a timber basis" and similar language to represent the broader tax benefits of establishing a timber basis then electing to deplete timber and filing paperwork as appropriate for the landowner's particular situation.

⁴ In some states, there are legal restrictions about who is qualified to provide a timber appraisal (i.e. a forester, appraiser, etc.). Consult local resources to understand timber appraisal requirements in your state.

Timber Tax Basics

The tax treatment of timber harvest income is an important consideration when determining the financial returns of forestland. Assuming property has been held for at least a year, when there is a timber sale, the proceeds of the sale can be taxable as a long-term capital gain,⁵ rather than ordinary income. This often results in a reduced tax rate, among other benefits. In addition to income qualifying as a long-term capital gain, landowners can consider deductions that are available to them based on their ownership type.

There are three main types of forestland ownership, each with different federal income tax implications:

- 1) **Personal use property** is held for personal use. Income is not a stated priority for the property though timber harvesting can occur.
- 2) **Investment property** is held with income as a stated priority, but the landowner does not regularly and continuously engage in the property's management.
- 3) **Business property** is held by a landowner with income as a stated priority and the landowner materially participates in the business.

Deductions are mainly restricted to investment and business ownerships. Eligibility for specific deductions can vary by ownership and are nuanced. More information on the requirements for each ownership as well as deduction eligibility are available at the National Timber Tax website timbertax.org.

One of the most common, accessible, and advantageous deductions is the depletion deduction.

Forest landowners establishing a timber basis (through a timber and land appraisal) can reduce federal income tax. With a timber and land appraisal, a cost basis for the timber (timber basis) is calculated. The timber reserves are “depleted” as harvesting takes place and the income on that timber **attributed to and up to the amount of the timber basis** is not taxed.

Establishing a timber basis typically costs money because an appraisal is necessary for the calculation, but it can result in tax savings through the depletion deduction. The decision model, based on the assumptions of the user, serves to answer the question “How much do depletion deduction tax savings exceed timber basis costs?” In other words, how much money will establishing a timber basis save a forest landowner?

In the best circumstances, establishing a timber basis will result in a financial benefit to the landowner, i.e. the tax savings will offset or exceed the costs of establishing the timber tax basis. In many cases, the tax savings will not exceed the appraisal costs. In these cases, establishing a basis can serve to partially offset the cost of an appraisal, and the decision model presents the net cost of the appraisal after tax savings (see Example 2 on page 10).

⁵ Throughout this publication and its examples, we reference the tax rate as a capital gains rate. While income from timber sales are often classified as a capital gain, this is not always the case.

Timber Tax Basis

The original basis of property is usually its cost (cash plus debt), along with any other expenditures incurred to acquire the property.

To calculate a timber tax basis the following information is needed: (1) acquisition cost, (2) a land appraisal⁶ (which can include all non-timber assets on the land); and (3) a timber appraisal. With these three elements, a ratio of timber appraisal to total FMV (this includes the timber value) is established and applied to the acquisition cost of the land (see Table 1).

| Timber Tax Basis Example | | | |
|--|-----------------------|--|-------------------|
| Total acquisition cost \$100,000 | | | |
| Asset Description | Fair Market Value (b) | % of total Fair Market Value (d) = b/c | Basis (e) = d × a |
| House | | | |
| Timberland 100 acres @ \$800 / ac | \$80,000 | 49% | \$49,383 |
| Timber, Merchantable 60 tons / ac @ \$13.66 / ton | \$82,000 | 51% | \$50,617 |
| Totals | \$162,000 (c) | 100% | \$100,000 |

Table 1: Example of timber basis calculation

Detailed information on establishing a timber basis as well as an online tool to calculate a property's timber basis can be found on the National Timber Tax website timbertax.org/getstarted/basis/calculate.

If a timber basis has been established, when timber is cut and sold, the timber is “depleted,” and a proportion of the income up to the timber basis is not subject to a tax.

Depletion Unit (DU):

- Basis = \$50,617
- Volume = 6000 tons

DU = basis ÷ volume
DU = \$50,617 ÷ 6000 tons
DU = \$8.44 / ton

As each ton is cut and depleted, \$8.44/ton is deducted and not subject to tax

In Example 1 (page 9), Landowner A owns a property with 6,000 tons of merchantable timber and her timber basis is \$50,617. She harvests 2,200 tons and generates \$30,067 dollars. She has established a timber basis and elects to deplete the timber. Callout Box 1 shows Landowner A's depletion unit which is multiplied by the volume harvested to arrive at the depletion allowance (2,200 tons × \$8.44 per ton = \$18,560). The taxable gain from the timber sale is \$11,507— \$30,067 - \$18,560 (depletion allowance).

Callout Box 1: Depletion unit

Depletion units change over time since they are based on the timber volume and timber basis at the time of a timber sale. In many cases, as the timber volume increases on a property, the amount that can be depleted per unit (e.g. per ton) will decrease.

The timber basis of inherited property is calculated differently than purchased property and is typically the FMV of the timber at the date of death. As a result, an heir's timber basis is usually “stepped up,” or increased substantially, relative to the decedent's timber basis.

To determine the timber basis for gifted property, a donor's basis, the FMV of the timber, and gift taxes paid are required. More information on establishing a timber basis for inherited or gifted property can be found at timbertax.org/getstarted/basis

⁶ In its simplest form this is raw land.

Appraisals

Timber and land appraisals are necessary to establish a timber basis and may be done when the land is acquired at purchase, gift, or inheritance. If they are not done at that time, they can be done retroactively. Retroactive appraisals are often more complex and costly.

Land Appraisal

Land appraisals have two common types, (1) a “commercial” (narrative) appraisal and (2) a residential-form type appraisal (e.g. Fannie Mae Appraisal Report Form). A commercial appraisal is more comprehensive and expensive. In many instances, the significant cost of a commercial land appraisal can greatly reduce the financial benefit of establishing a timber basis. For most forestland situations, the residential appraisal is an acceptable and cost-effective option. The costs may vary depending on location, the appraiser, and difficulty finding comparable sales. Usually costs are a few hundred dollars⁷. In many instances, an appraisal may be conducted as part of the financing process so there is no “extra” land appraisal cost when establishing a timber basis. If the basis was not established at the time of acquisition, the appraiser must establish the appraised value retroactively.

For unimproved forestland, a land appraisal combined with a timber appraisal will be enough to establish a timber basis. In some cases, when there is a residence or other assets on the property, additional information will need to be accounted for to determine FMV.

For the purposes of this publication, land appraisal refers to the land itself and additional non-forest assets (e.g. a house, etc.).

Timber Appraisal

For IRS purposes, when establishing a timber basis, the timber appraisal needs to identify the value of the timber in the year the property was acquired (not during the year when the timber appraisal was conducted). If a timber appraisal is conducted years after the property is acquired, a forester can use an established practice to calculate growth during the intervening years to determine timber volume and use historical stumpage value information to assign a timber value for the year when the property was acquired. Typical costs for a timber appraisal vary greatly and reflect many factors including the difficulty or specialization of the service, sampling intensity, forester’s profit margin, market conditions, etc.

In New Hampshire, a forester can provide a timber appraisal and include it in a forest stewardship plan.⁸ Some forest landowners may opt to produce a full forest stewardship plan rather than a timber appraisal only. A forest stewardship plan can help landowners systematically understand the property’s resources and provide action items to meet stewardship goals over a defined period of time; a timber appraisal will provide a valuation of the timber as of a specified date.

⁷ Based on informal conversations with real estate appraisers in 2014.

⁸ In some states, there are legal restrictions about who is qualified to provide a timber appraisal (i.e. a forester, appraiser, etc.). Consult local resources to understand timber appraisal requirements in your state.

Timber Basis Decision Model

Overview

The timber basis decision model and a link to instructions are found at extension.unh.edu/timber-basis. The model is composed of (1) an inputs section, (2) a model that processes the entered data, and (3) outputs of the model results. Only the input and output sections are visible to the user. The formulas associated with processing the data are hidden, but are described in this document.

There are two options to provide inputs based on the users assumptions:

- (1) Under the “home” tab, “Complete Information for the Timber Basis Decision Tool” section allows the user to populate the fields directly, or
- (2) a user can click the green “start interview” button at the top of the page and answer a series of questions. The fields under the “Complete Information for the Timber Basis Decision Tool” section will be populated based on the responses to the interview.

To use the model, a user will need information about the property including acres, estimated (per acre) timber volumes and value at acquisition and the estimated volume at harvest. *Timber volume and value inputs are estimates*. These estimates are used to determine if there is a financial benefit for the expense of a forest inventory. Users can make these estimates conservative (represent less value) if they feel it is warranted. If a forest inventory is completed, the timber appraisal replaces the estimates and is used for all purposes.

Next, information is entered to determine the timber basis and associated tax information of the landowner. Timber volume and value inputs entered previously are incorporated, while adding FMV of assets, acquisition costs, and the landowner’s preferred subaccounts.

The last inputs section relates to the decision model itself. It is based on certain management decisions and assumptions including cost of a timber appraisal, cost of the land appraisal, years until appraisal, discount rate, years until the timber harvest, capital gains rate, harvest volume and inventory volume at harvest. See the listing in Callout Box 2 on page 7.

With these inputs, the landowner can estimate the current value of his/her revenue and costs (see p.6 Model Detail).

The outputs of the model include the financial impact section which highlights the implications of establishing a timber basis (e.g. the tax savings through using the depletion deduction and the net tax savings after appraisal costs). The timber basis summary, some property timber volume data, and information related to depletion is also provided.

Model Inputs and Outputs⁹

The financial benefits of establishing a timber basis can fully offset the costs of establishing a timber basis if the present value of the tax savings on a future timber sale exceed the cost of the appraisal necessary to establish the timber tax basis.

This is evaluated by calculating the present value of the tax liability in the year of the timber sale less the cost of the appraisal (land and timber) in the year of the appraisal. If the tax savings of the future timber sale exceed the costs of the appraisal then there is a clear financial benefit to produce a timber basis.

⁹ Inputs to the model by the user are highlighted in bold and italicized throughout this document.

(1) Financial Benefit

$$\begin{aligned} &= \text{Net Present Value of the Tax Savings on Future Timber Sale Income} \\ &- \text{Net Present Value of the Cost of Establishing a Timber Basis} \end{aligned}$$

If the tax savings of the future timber sale do not exceed the costs of the appraisal then there is not a clear financial benefit to producing a timber basis.

A landowner may opt to have an appraisal done despite a cost that exceeds the financial benefit (e.g. as part of a forest stewardship plan). In these circumstances, establishing a timber basis can serve to partially offset the appraisal cost through future tax savings.

Below we detail each of the component parts of equation (1) and their inputs. We do this in in three sections

- Tax Savings on Future Timber Sale Income (the financial benefit) beginning with timber basis.
- Cost of Establishing a Timber Basis (the costs)
- Net Present Value (evaluating the present value of the financial benefit and costs)

Timber Basis

Inputs are required for timber basis calculations; specifically, the acquisition cost and the acquired assets' (land, timber, and other assets) fair market value at the time of acquisition (see Table 1).

Total acquisition cost is the price paid for the assets. **Fair market value of house**, and **fair market value of timberland** [land] are the appraised values of the acquired assets and are entered under the "Timber Basis Inputs" section of the decision model.¹⁰

Fair market value of the timber is calculated under the "Property and Market Information" section of the decision model. The volume per acre at the time the property is acquired (**volume per acre at acquisition**) and the associated value per unit (**cost per unit at acquisition**) is entered.¹¹ Value per acre is calculated and multiplied by the **property acreage** to arrive at the FMV of the timber.

The percentage of fair market value is established for each asset and applied to the acquisition cost. The resulting calculation is the basis for each asset and is summarized in the "Estimated Basis" section.

This process and calculation is described further on the National Timber Tax website timbertax.org/getstarted/basis/purchased.

Tax Savings on Future Timber Sale Income

An established timber basis allows a landowner to take advantage of the depletion deduction when a timber harvest occurs and revenues are generated thereby reducing the tax liability on timber harvested up to the amount of the timber basis.

$$(2) \text{ Tax Savings on Future Timber Sale Income} = \text{Capital Gains Rate} \times \text{Depletion Allowance} \leq \text{TimberBasis}$$

- **Capital gains rate** is set at 15%. This can be changed if the user's income requires a higher capital gains rate or if the income is a short-term capital gain.

¹⁰ The acquisition cost and FMV may not and most likely won't be the same number.

¹¹ The volumes per acre may initially be ocular estimates to aid in decision-making. These estimates are inputs to help decide whether the expense of a forest inventory will be offset by the tax benefits of establishing a timber basis. Once a forest inventory takes place, the timber appraisal results can replace the initial estimates.

- Depletion allowance is the *harvest volume* × *depletion unit*. The depletion allowance, coupled with the capital gains rate, determines the tax savings of the landowner. A depletion unit is calculated based on the timber basis and current timber volume; it accounts for new growth. The depletion unit is based on the timber basis ÷ current inventory levels and not the inventory levels when the property was acquired. As such, *volume per acre at timber harvest* is the input field that is used to calculate the depletion unit.
- **Estimated total harvest volume** is entered under “Decision Tool Inputs” and is multiplied by the depletion unit to calculate the depletion allowance. The estimated total harvest volume should reflect the timber accounts selected. For example, if the “Merchantable (Tons) and Young Growth” account is selected, total volume should be represented in tons; whereas total board foot volume harvested can be represented when the associated timber account is selected (e.g. “High Grade (MBF)¹², Low Grade (Tons) and Young Growth”).

Cost of Establishing a Timber Basis

The timber basis cost is comprised of the timber appraisal cost and the land appraisal cost.

(3) *Timber Basis Cost = Timber Appraisal Cost + Land Appraisal Cost*

- **Land appraisal cost** is typically the cost of a residential-form type appraisal.
- **Timber appraisal cost** is typically the cost of a forest inventory. The qualifications, or the standard, necessary for a timber appraisal can vary by state.

Net Present Value

It is common practice to apply a discount rate to the value of money in the future. The value of a dollar five years in the future is worth less than the current value of that dollar because of compounded interest. We use the following equation.¹³

$$(4) \text{Net Present Value (NPV)} = a \left[\frac{1}{(1+i)^n} \right]; \text{ where } a = \text{cash flow, } i = \text{interest, } n = \text{time}$$

The net present value equation is applied under “Decision Tool Inputs,” *years until appraisal* and *years until harvest* is used as an input (n = time) to assess the present value of the timber appraisal cost and revenue (detailed below).

Model Detail

Using the equations above, the initial equation (1)

Financial Benefit

$$= \text{Net Present Value of the Tax Savings on Future Timber Sale Income} \\ - \text{Net Present Value of the Timber Basis Cost}$$

can be written with all the inputs as:

¹² Mbf is one thousand board feet, i.e. 1,000 board feet

¹³ Klemperer, W. D. [1996]: Forest Resource Economics and Finance. McGraw-Hill Series in Forest Resources. U.S.A. 551p. (p111)

(5) *Financial Benefit*

$$= \left\{ \left[\frac{1}{(1+i)^{nH}} \right] \times \left[\text{Capital Gains Rate} \times \text{Harvest Volume} \times (\text{Timber Basis} \div \text{Inventory Volume at Harvest}) \right] \right\}$$

where i = interest, nH = time until harvest

$$- \left\{ \left[\frac{1}{(1+i)^{nA}} \right] \times (\text{Timber Appraisal Cost} + \text{Land Appraisal Cost}) \right\}$$

where i = interest, nA = time until appraisal

- Cost of a timber appraisal
- Cost of the land appraisal
- Years until appraisal (nA)
- Discount rate (i)
- Years until harvest (nH)
- Capital gains rate
- Harvest volume
- Inventory volume at harvest
- Timber basis

The model includes calculations to determine timber basis. For clarity, those calculations are not deconstructed in the equation above (5); instead an example with corresponding model inputs are detailed in (see Table 1). Further examples are available at the National Timber Tax website timbertax.org/getstarted/basis/purchased.

A list of timber basis decision model inputs (equation 5) are in Callout Box 2.

Callout Box 2: Decision model inputs

Options

This model is based on assumptions and has a number of options to create flexibility for the user. Some of the options not covered previously include:

- **Conversion factors** – The user may select conversion factors between MBF, cords and tons. The default is 1 MBF = 2 cords = 5 tons. Conversions factors are important since volumes may be converted to different units depending on how timber accounts are set up. For example, if the user has selected the “Merchantable (tons) and Young Growth” timber account, sawtimber measured in MBF will be converted to tons.
- **Discount rate** – The discount rate affects the net present value calculations in the model (i = interest rate). It may be adjusted to reflect the user’s assumptions.
- **Select timber accounts** – This model can make calculations that reflect three different timber account options.
 - (1) Merchantable (Tons) and Young Growth
 - (2) High Grade (MBF), Low Grade (Tons) and Young Growth
 - (3) Sawtimber (MBF), Firewood (Cords), Pulp (Tons) and Young Growth

The calculations and summary results will reflect the conversion factors entered and the timber accounts selected.

Model Output - Financial Impact

Based on inputs, the model summarizes select financial impacts and timber tax information.

- **Net present value tax savings** shows the present value of the tax savings realized through establishing a timber basis and electing to deplete the timber. This may or may not exceed the costs of establishing a timber basis.
- **Net present value tax savings per acre** shows the present value tax savings per acre. It uses the net present value tax savings results and divides that by the *property acreage*.
- **Net cost of appraisal after tax savings** – If the cost of establishing a timber basis exceeds the financial benefits, the timber basis can still serve to partially offset the cost of the appraisal.
- **Amount that tax savings exceed cost of appraisal** – If the present value tax savings exceed the costs, this field will show the total financial benefit to the landowner.

Model Output - Other Timber Tax Information

This section summarizes additional model outputs:

- **Estimated basis** provides basis information for timber, land (timberland), and house. Note: the house input and output fields represent a house, structure(s) or can be a catch-all for all other non-timber and non-land assets.
- **Estimated volume at harvest** represents the total estimated volume on the property when the harvest is expected to occur. Units of volume (MBF, cords, tons) reflect the timber accounts that are selected. Calculations use the *volume per acre at harvest*.
- **Depletion per unit** provides depletion unit information based on the timber subaccounts that are selected. The depletion unit can be multiplied by harvest volume to arrive at depletion allowance.

Common New Hampshire Examples

A number of variables and assumptions influence whether there is a financial benefit to a landowner who establishes a timber basis. Each landowner’s situation is different; it is impossible to show the full range of scenarios applicable to a landowner; however, below we outline three representative scenarios to demonstrate how this decision model can be used. The scenarios below are generalized examples and are not exercises in precise modeling.

This decision model should be used in context. It evaluates one of many considerations for forest landowners—the tax treatment of timber harvest income. **It should not be a substitute for professional forestry expertise or thoughtful decision-making.**

During initial consultations with a landowner, a forester will often address the equation inputs (see Callout Box 2) in informal terms through discussion and observations:

- “How long have you owned the property?”
- “Are you interested in long-term stewardship of the property?”
- “Are you interested in having a timber sale in the near term or at some time down the road?”
- What does the resource look like? (forester observation of stocking, value, etc.)
- Could it benefit from a treatment in the near term or does it need to grow? (forester observation)
- If it could benefit from a timber sale, would it generate a modest amount of money per acre or a more significant amount? (forester observation)
- “Is this an investment? If so, what sort of a financial return are you expecting?”

The answers to these questions, along with a few additional assumptions (e.g. the estimated cost of a management plan for the property), provide the model inputs.

Example 1: Moderate harvest within 1 year of management plan development

It is common for landowners developing management plans to ask the forester to develop a plan in conjunction with a timber harvest to offset the cost of the management plan.

| Landowner A | |
|--|-----------|
| | Total |
| Land appraisal cost | \$450 |
| Timber appraisal (mgmt. plan) cost | \$2,000 |
| Acreage | 100 |
| Discount rate | 5.0% |
| Years until the timber harvest | 1 |
| Years until timber appraisal | 1 |
| Capital gains rate at the time of the timber harvest | 15% |
| Harvest Volume ¹⁴ | 2200 tons |
| Inventory Volume at Harvest ¹⁵ | 6000 tons |
| Timber basis ¹⁶ | \$50,617 |
| Direct Financial Benefit | |
| Present Value Tax savings (after costs) | \$318 |

Landowner A owns 100 acres of mature mixedwood that she recently acquired. Her forester walks the property and discusses the landowner’s goals, including income considerations.

Using assumptions entered into the decision model, the landowner can expect to receive \$318 of tax savings by establishing a timber basis; the appraisal is “free” based on the tax savings.

¹⁴ For all examples, timber accounts are represented as Merchantable (tons) and Young Growth. As such, all volumes are expressed in tons.

¹⁵ For examples 1 and 3 the time between timber appraisal cost and timber harvest is less than a year, and we use the same inputs for volume per acre at acquisition and volume per acre at Timber Harvest.

¹⁶ For all examples, the timber basis inputs are: acquisition cost of \$100,000; FMV of timberland of \$80,000 and FMV of timber is \$82,000 (5 MBF @\$150, 35 tons @ \$2).

Example 2: Light harvest 15 years after management plan development

Many landowners value the aesthetics, philosophy and sustained income of light harvests and regular entries.

| Landowner B | |
|--|-----------|
| | Total |
| Land appraisal cost | \$450 |
| Timber appraisal (mgmt. plan) cost | \$2,000 |
| Acreage | 100 |
| Discount rate | 5.0% |
| Years until the timber harvest | 15 |
| Years until timber appraisal | 1 |
| Capital gains rate at the time of the timber harvest | 15% |
| Harvest Volume | 1500 tons |
| Inventory Volume at Harvest ¹⁷ | 7500 tons |
| Timber basis | \$50,617 |
| Direct Financial Benefit | |
| Present Value Tax savings (after costs) | None |

Landowner B recently acquired 100 acres. With her forester, she discusses her goals and objectives including the financial trade-offs of establishing a timber basis.

Using assumptions entered into the decision model,¹⁸ Landowner B's forester finds that there is no clear financial benefit for establishing a timber basis. Landowner B would spend \$2,450 (NPV of \$2,333.33 after the first year) on a management plan and land appraisal to save a NPV of \$730 in taxes. However, because she is interested in long-term stewardship and values the benefits of a management plan,

she views the tax savings as partially offsetting the cost her management plan (and associated appraisal costs). The model shows her the "true" cost of her management plan is approximately \$1,600.

Example 3: Liquidation Harvest and Land Sale

There are some instances where forest landowners feel it is necessary to liquidate the timber from a property and sell it. Liquidation harvesting is not recommended from a stewardship perspective but is a reality — and supports some landowners' goals to maximize short-term cash flow from their forestland.

| Landowner C | |
|--|-----------|
| | Total |
| Land appraisal cost | \$450 |
| Timber appraisal (mgmt. plan) cost | \$2000 |
| Acreage | 100 |
| Discount rate | 5.0% |
| Years until the timber harvest | 1 |
| Years until timber appraisal | 1 |
| Capital gains rate at the time of the timber harvest | 15% |
| Harvest Volume | 5500 tons |
| Inventory Volume at Harvest | 6000 tons |
| Timber basis | \$50,617 |
| Direct Financial Benefit | |
| Present Value Tax savings (after costs) | \$4,295 |

Landowner C owns 100 acres; she wants to maximize her short-term income and plans to cut heavily and sell the property to meet this objective. Because there is no long-term management objective, she does not want to establish a full management plan, but does want to determine whether establishing a timber basis is financially beneficial. Because she has held the property for a long period of time, the basis needs to be established for when she acquired the property. Based on her assumptions, she will save an additional \$4,295 dollars in taxes by figuring her timber basis.

¹⁷ Growth (1.25 MBF per acre and 8.75 tons per acre results) in 6.25 MBF and 43.75 ton per acre.

¹⁸ We do not calculate inflation of assets into this example.

How the Decision Model Helps with Deliberate Decision-Making

The timber basis decision model is intended to help landowners understand the financial implications of establishing a timber basis. It evaluates trade-offs of the tax treatment of timber harvest income. It does not integrate financial analysis of the timber resource itself (or the value of non-timber products). There can be a scenario where there is a clear financial benefit to take certain action from a tax standpoint, but the type of cutting or the volume removed to generate that income may reduce long-term financial returns on the forestland—or degrade the resource (the forest’s health, resiliency, non-timber attributes of the property, etc.). A forester can help landowners understand the complex tradeoffs with any forest management decision.

Landowners are most likely to benefit from establishing a timber basis if their timber harvest generates a moderate or significant amount of income and that income occurs shortly after the appraisal costs are incurred. These tend to be landowners with a mature forest resource and are interested in active forest management. In general, we find the following:

The financial benefit is clearer for individuals who are actively managing the property and cutting closer to the purchase rather than later. Typically, the closer the timing of the harvest (i.e. cash generation) to the outlay of money (i.e. the cost of the appraisal), the more advantageous it is financially for a landowner to establish a timber basis.

Financial benefits of establishing a timber basis are greater on properties with more timber value, specifically medium to high timber value.

- Owners of a more mature, higher value, timber resource are often more likely to benefit from the establishment of a timber basis.
- The benefits of establishing a timber basis become more likely to offset or exceed the cost of an appraisal as more timber is cut—“a couple MBF or more per acre.”
- As timberland acquisition cost decreases and/or as land appraisal value increases, the timber basis (potential for depletion) decreases.

Inherited properties with a “stepped up” basis provide excellent opportunities to benefit from the depletion deduction.

- An inherited property may have an original timber basis that equals the FMV of the timber. This can result in a high depletion allowance (depletion unit) relative to many other acquisition scenarios.
- The costs associated with establishing a timber basis may be “sunk” and incorporated into the estate administration process leaving no barriers to deplete timber when there is a timber sale.

The cost of establishing a timber basis, particularly the fieldwork associated with the timber appraisal, is the greatest deterrent to establishing a timber basis.

- As acreage increases, typically the cost per acre of the timber and land appraisal decreases. Generally, properties that are larger that have an economy of scale for forest management are more likely to be able to realize the greatest financial benefit of establishing a timber basis.
- There may not be any direct cost for a land appraisal; land appraisals are often necessary when financing is involved, and the appraisal can be used to establish basis.

There is no inherent conflict between landowners *considering* the tax treatment of timber income and good, long-term, silviculturally sound forest management.

- There are examples of conflicts between good forest management and optimizing the tax treatment of timber harvest income. Foresters should be aware of where those conflicts can exist; however, there is no inherent conflict between good forestry and tax considerations of harvest income. We hope that

this decision model serves to provide one additional opportunity to make good forestry a profitable, sustainable and realistic option for forest landowners.

- One concern is that long-term income from forestland can be compromised by looking solely at the tax treatment of harvest income without recognizing other important considerations such as stand composition, quality, stocking and structure. The timber and non-timber attributes of a property and their associated benefits may be compromised if a landowner is evaluating a decision based solely on the tax treatment of harvest income.

A timber appraisal¹⁹ and a forest management plan are related, but are not the same. A timber appraisal is used to establish a timber basis and is typically beneficial to individuals who actively manage their property and have a mature resource base. A forest management plan adds more information about a landowner's property and is based on his/her goals and objectives, giving the individual information to make informed management decisions, including financial decisions.

A Word of Caution and Endorsement

This is a tool to help make decisions about the potential financial tradeoffs of establishing a timber basis. However, there are many assumptions and generalizations that go into the model. The validity of the model rests upon these assumptions. Despite the words of caution, there is great opportunity to use this tool to make returns on forestland more profitable. It is important to use this decision-making tool in its proper context which should occur when there is a knowledgeable forester involved.

Conclusion

The equation presented in this publication is a decision-making tool—it can be modified to meet a specific landowner's goals and needs. Estimates, assumptions and inputs can be modified to reflect different situations, risk, etc. The analysis and conclusions should not be a sole determinant in making management decisions; for example, there may be situations where this model shows that more aggressive cutting early in ownership process may offset the cost of a management plan, or be beneficial from a tax standpoint. Nonetheless, this may not optimize financial returns because of the growth rate, size, and quality of the timber—as important, the interest of the landowner are rarely purely financial.

However, the model can be used to better understand financial and tax implications of establishing a timber basis. In the best scenarios, financial interests and management interests align and developing a timber basis provides a greater financial benefit, results in additional education through the management planning process, and results in more opportunities for forestry services.

¹⁹ In New Hampshire, licensed foresters can appraise timber though this may not be true in other states.

The Natural Resource Network Reports

The Natural Resource Network presents this material as a part of series of research reports and publications of interest to educators, resource professionals, landowners and the public. Additional copies are available from the University of New Hampshire Cooperative Extension Forestry Information Center, 131 Main Street, Nesmith Hall, Durham, NH 03824, or at our website extension.unh.edu.

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Natural resource professionals are working toward improved ways to conserve and use the natural resources of New Hampshire. The Natural Resource Network was formed to improve the interaction among researchers and those who provide outreach education in many kinds of programs. Teachers, outreach professionals and resource managers can bring research-based education to diverse audiences. At the same time, those audiences, or consumers, identify issues and needs for educational programs which can be addressed by controlled research. Well informed and knowledgeable professionals, free-flowing exchange of information, an advantageous and gratifying professional environment, and natural resource planning are goals of the Natural Resource Network.



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