THE WOODLAND WORKBOOK

BUSINESS MANAGEMENT

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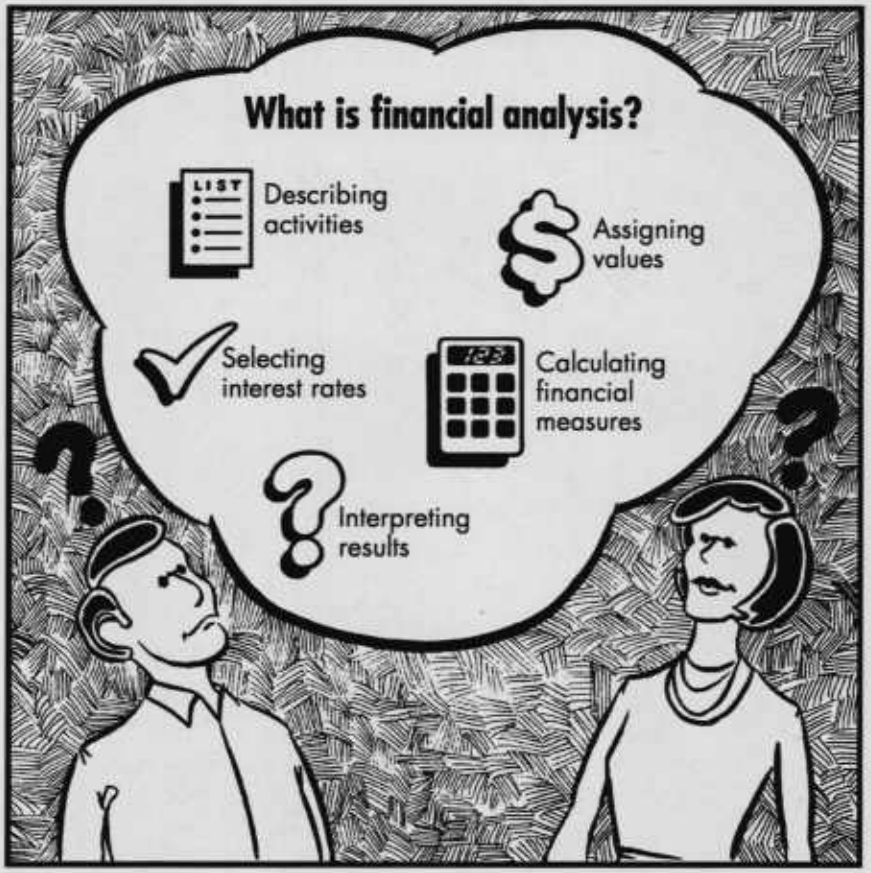
Forestry Financial Analysis I: An Introduction for Landowners

N.E. Elwood and R.O. McMahon

During the course of any woodland operation, the owner inevitably wonders whether an activity is really worth the money that it will cost. Questions like "Would it be more profitable to thin now, or should I not thin at all?" or "Can I really lease that extra 25 acres and still make a profit?" are common.

Answering them brings woodland owners face to face with financial analysis—an area in which many feel inadequately prepared and that they would prefer to ignore. Decisions, therefore, frequently are made with inadequate information and with more uncertainty than is really necessary.



This publication is the first of several about forestry financial analysis. Its purposes are to introduce the subject of financial analysis, to answer several common questions about it, and to prepare you to use the how-to-do-it guides found in EC 1147, *Forestry Financial Analysis II: Worksheets for How-to-Do-It,* and EC 1148, *Forestry Financial Analysis III: How to Compare Two (or More) Investments.*

Other publications discuss in more detail separate aspects of the financial analysis procedure.

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Financial fundamentals

General questions

Most people wonder at first just what financial analysis is. Actually, it's nothing more than an organized procedure for calculating financial measures of an investment's worth. Its purpose is to generate information to use for making decisions about an investment's profit-making potential.

Because most woodland owners don't consider themselves investors, they often ask this second question: "What *is* an investment?"

An investment is any activity in which a person spends money with the expectation of obtaining either a physical or monetary return, or both. Woodland investments can range from purchasing land to buying a new firewood splitter.

In this and companion publications, we'll use the terms *investment* and *project* interchangeably, because the projects we'll be discussing require an investment of time and money, or both.

Knowing what to expect is important in deciding whether to use financial analysis and when and where it is used best. Analyses can show:

- An investment's profit potential, given the physical and financial assumptions you've made about the project
- The relationship of individual costs and returns to each other and to the investment's overall profit potential
- The effects of change in both the physical nature of the project and the existing financial environment

Perhaps most importantly, the analytical process forces you to think clearly about each step of a project and to obtain all of the information you need to complete the analysis.

An analysis won't tell you whether an investment or one of its component activities will *always* be profitable. Any change in underlying conditions may affect profitability, which you can check only by reevaluation. An analysis does not guarantee what *will* happen; it can show only what *might* happen, given your information and assumptions.

Financial analysis is used best when money either is *the* main factor on which your decision will be based, or when it's *one* of the more important of a set of factors. Financial analysis is not a technique for all situations. It certainly is not an end in itself—it's a means to an end. It's a coordinated and systematic framework within which you can evaluate projects consistently.

Finally, the question always arises, "What will I be able to do with this procedure?" Financial analysis takes all of the *known information* about an investment, combines assumptions made about the unknowns, and integrates both with a computation process that reduces the information to a single number reflecting the investment's expected profit-making potential.

Using the instructions and worksheets found in these publications on financial analysis, you can complete an analysis and use the results to evaluate the investment's expected performance and to compare different projects.

Woodland activities commonly evaluated include:

- Precommercial and commercial thinning
- Land purchase, rental, or lease
- Timber stand improvement
- Christmas tree or conventional timber production projects
- Tax management strategies

Different projects of the same nature (for example, two thinning systems) or totally different investments (thinning project vs. savings account) often are compared.

Personal questions

After deciding that you do indeed need the information from a financial analysis, your concerns should focus on these questions: "What do I need to do on an analysis? How long will it take? How do I begin?"

Financial analysis requires skills that you either already have or easily can learn. The

References to other publications

When you're referred to another OSU Extension Service publication, you'll find additional information in "For further reading," page 8.

ability to follow instructions, to use basic mathematics (add, subtract, multiply, and divide), to use numbers in an organized way, and to apply the concepts presented in this set of publications are all that is required.

Fancy equipment is not needed. Paper, pencils, and compound interest tables (provided in EC 1147 and EC 1148) are the only requirements. Although not essential, an electronic calculator can save time. Sophisticated calculators are useful, but those that add, subtract, multiply, and divide are good enough.

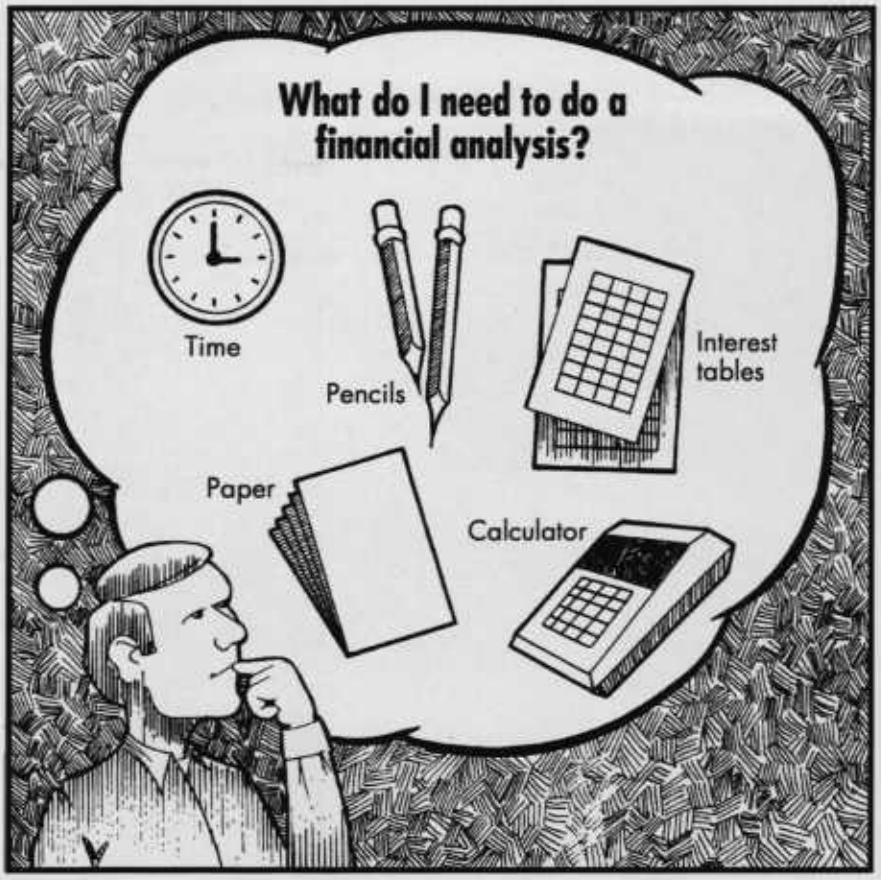
The time spent on an analysis really has two aspects, time to *learn* and time to *do*.

Learning time depends on your previous experience. If you are just beginning, for example, you can expect to spend at least 4 hours studying the first three publications in this set. If you're more experienced, you might need only an hour or so to refresh your memory and to study the examples in EC 1147 and EC 1148.

Learning time also depends on how much you want to know about the subject. Six to 7 total hours of study and practice should be enough for most beginners to understand the basic steps. More complex applications and concepts, however, probably will require a minimum of 8 hours of study and practice.

Doing time depends on your ability to collect and to organize material, and on your mathematical ability. Financial analysis requires considerable information. The time needed to collect it depends on whether the information exists, either in your mind or in your records, and on how readily you can retrieve it. One to 2 hours is a reasonable expectation *if* you have recorded the needed information previously. If you haven't recorded or can't find the information, getting organized takes longer.

Once you have the necessary information, "doing" the analysis can take from a few minutes to an hour or so, depending on whether you have a calculator, its capabilities, and your proficiency with it.



Performing a financial analysis

Getting started

The following steps provide a good framework for approaching a financial analysis:

- Make sure you know *what* you want from the analysis.
- Organize your procedure.
- Gather the necessary data.
- Do the calculations.
- Study the results *and* reexamine your initial assumptions.
- Redo the analysis to see how changes in the basic information would affect the outcome of the analysis.

The information needed for an analysis falls into two categories, physical and financial. Physical information refers to a project's dates, times, and physical inputs and outputs. Financial information refers to such things as resource costs, product prices, interest and inflation rates, and how

each is likely to change with time. To evaluate a thinning treatment, for example, at the minimum, you would need to know:

Physical information

- Stand age at the time of thinning
- Exact date of the thinning
- Growth response because of thinning (the amount of extra wood produced by thinning compared to the "no thinning" production)
- Date that the growth response will be measured (in 5 years, 20xx; in 10 years, 20xx; in 20 years, 20xx; in 35 years, 20xx; etc.)
- Resources needed to accomplish the thinning (hours of labor, gallons of fuel, replacement parts or service calls to maintain machinery, equipment leased or purchased, etc.)

Financial information

- Costs of the physical resources (labor, machinery, fuel, filters, etc.)
- Prices anticipated for the products produced ($/MBF for timber harvested during the thinning), including how future prices are expected to change relative to current prices
- Cost of money borrowed to finance the investment (interest rate)

Obviously, you won't know all of this with complete certainty. It's normal, then, for some items to be informed estimates. These assumptions are part of every financial analysis. After completing the analysis, you must be sure to examine the effects of changes in the physical and financial data, to test whether such changes have a strong effect on the income.

If the outcome is sensitive to even slight changes in the data, take special care to get accurate information and to make careful estimates of the inputs that have the strongest effect on the results.

Handling important details

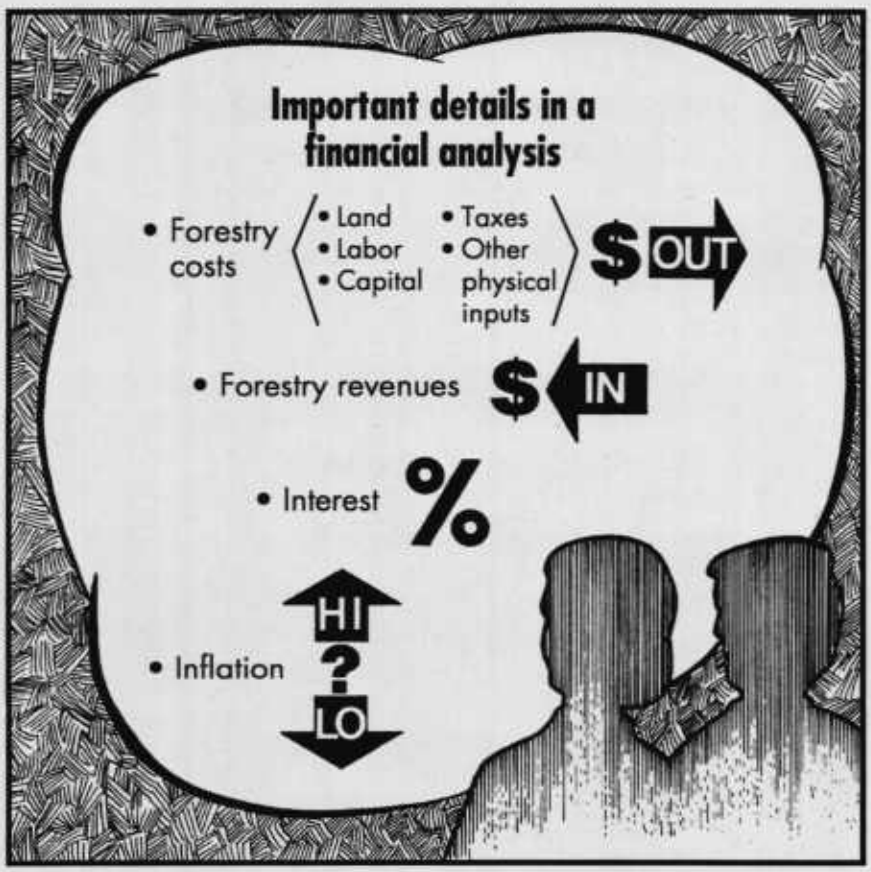
Forestry costs

When undertaking an investment, probably the first thing asked is, "How much will it cost?" Most costs will be included in land, labor, capital, taxes, or other physical categories.

For most forestry investment projects, you won't need to include *land costs* because most frequently you already own the land. Because this is so, land costs are not a direct result of having undertaken the forestry project. Charging land costs to your project would unfairly bias its financial performance.

If, on the other hand, you purchased or leased the land specifically for the forestry project, then you should include the land costs. They are clearly part of the project because you wouldn't have incurred them if you had not undertaken the project.

Nearly every woodland project will require labor, either that of someone you hire or your own. Clearly, you must charge those costs for labor you hire. Whether to include or exclude costs for your own time and labor, however, depends on how you view your woodland operation. Although it's purely a personal decision, there are some general guidelines that should be helpful.



First, here are some reasons for *including* your own time and labor values. If you want to include everything in the analysis, then include all labor costs, whether contracted or self-supplied. If you give up another income-producing activity to work in your woodland business, then charge a fair dollar value for your time and labor to the woodland operation. Even if you consider your time and effort as a hobby, you may still want to assign dollar values and include them in any analysis.

On the other hand, if you're interested only in comparing projects requiring nearly equal time and labor inputs, you may choose to *exclude* all labor costs (both those contracted and your own). If you consider the woodland activities purely recreational, *and* if you're willing to "write off" your time and labor, then exclude their values.

If you do include your time and labor costs, you can determine the charges with a direct approach, such as dividing your net dollar returns from past woodland activities by the amount of time invested, thus generating a dollar-per-hour equivalent.

Or you can choose a more subjective approach and guess at the value, based on experience with other activities that you *might* reasonably undertake ("I might consider that part-time job paying $6.00 an hour; therefore, I'll consider my woodland labor worth at least $6.00 an hour").

There are no certain answers here. Your personal objectives and philosophies must guide your decision.

Whenever you borrow money, you incur *capital costs.* Depending on the amount you borrow, the terms of the loan, and your other financial commitments, capital costs can be major items of consideration in a woodland operation.

Even though many woodland owners receive financial assistance for projects through various Federal cost-sharing programs, borrowing and its resultant costs are common.

Just as with land, if you borrow specifically to finance a project, then you should charge all interest money, loan fees, and other related expenses to the project.

Inevitably, you'll wonder whether to include *taxes* in your financial analysis. Unfortunately, there is no absolute answer. The purpose(s) of the analysis should guide your decision to include or exclude taxes.

There may be some situations in which the results will be equally useful if taxes are excluded. For example, if you're comparing several projects having quite similar tax situations, you may exclude taxes, thus simplifying the computations, and still have enough information to make a decision.

If, however, you want a complete picture of the project's financial performance with all possible costs included, or if you are specifically investigating tax consequences, then you must include taxes.

Finally, you must charge costs for many *other physical factors* to your projects. For example, these might include:

- Gasoline, oil, filters, replacement blades, saw chains, and other parts for saws and other power equipment
- Fertilizer, chemical sprays and sprayers, cement, and other construction materials
- Hand tools, such as shovels, axes, planting bars, and machetes
- Specialized measuring tools like diameter tapes, range finders, logger's tapes, sampling prisms, and increment borers
- Purchase, rental, or lease of larger equipment (saws, skidders, roadbuilding machinery, etc.)
- Specialized computer equipment and services (programs, timesharing services, specialized analytical processing)

You must include in your analysis the costs for each of these items and others not listed but unique to your project.

Forestry revenues

Revenue obviously comes from the sale of products. Logs, posts, poles, lumber cut onsite, Christmas trees, grazing, hunting, and other recreation privileges, for example, are just a few of the diverse number of products generated by forestry projects. To complete any analysis, you must know exactly:

- What the products will be (description of size, quality, etc.)
- When they will be produced (for example, year 15 of a 30-year project)
- How much will be produced
- What prices to expect for each product

With this information, it's an easy matter to complete the usual "price x quantity" calculation to determine revenue and to make the other time-related financial calculations.

As we all know, prices seldom remain constant. Both prices for resources used to complete a project and prices for products generated change regularly. Thus, revenues also can be expected to fluctuate. Inflation is an important factor contributing to price changes, including changes in stumpage price.

Stumpage prices and their changes through time are very important factors affecting the outcome of an analysis. In the short run, we've all seen stumpage prices decrease; however, over the long haul, the trend has been up—and the average rate of increase has exceeded the rate of inflation.

The rate of increase depends on the species, locality, and time period being considered. When doing a financial analysis, you would be well advised to talk with your local Extension agent and your county, state, or consultant forester about stumpage price changes for your area and type of timber.

Interest

Choice of interest rate is an important decision because it affects all of the financial calculations. Before choosing the rate, however, you should understand the function that interest rates serve in financial analysis. Would you be willing to postpone a paycheck for 1 year, 2 years... 30 years? Probably not, unless you could receive more money then than now.

The extra money that you'd demand is called *interest.* It is the money that you would receive in return for making an investment—a payment to you for the passage of time. Interest rates merely express this rate of dollar return in percentage terms. A $10 return from a $100 investment made 1 year ago translates into a 10 percent rate of return.

Whenever you use an interest rate in an analysis, you are really *comparing* that investment against another hypothetical project expected to produce a rate of return equal to the interest rate you've chosen. Even though you're analyzing only one project on paper, you really are asking, "How does my project compare with another one that would earn X percent interest?" At the minimum, then, you are always comparing two possible investments.

Most people approach choosing an interest rate by asking, "What rate *should* I use?" Because, theoretically, *any* rate will work, a better question is "What is a reasonable and appropriate rate?" Two common approaches often are used.

The first is to use the rate charged on money you would borrow to accomplish the investment project. The second is to use an interest rate equal to the rate of interest that you could earn in another investment (such as a savings account or another forestry operation) if you put your money there.

Either approach is reasonable. You must be the final judge of which interest rate is most appropriate to your situation.

Inflation

When doing a financial analysis, you must eventually come to grips with inflation. The usual question is, "What should I do about it?" The issue is whether the analysis should include or exclude inflation and, if included, what rate to use. There is no absolutely correct or incorrect answer. Both including and excluding have advantages and disadvantages.

If you're making the analysis in times of relatively high general inflation, including its effects will keep the situation more in tune with reality (and including it ensures that you have accounted for one of the major financial variables).

When you include inflation, however, the calculations are more complicated because you must take extra steps. Interpretation is more complicated because once you include it, you can't easily separate inflation's effects from the financial results. A mixed picture emerges, one containing both genuine project results and results from the effects of inflation.

Excluding inflation also has advantages and disadvantages. If you do exclude it, obviously there is no need to distinguish genuine project performance from inflation's effects (and the calculations are easier).

The big disadvantage is that you can be left with only a partial picture of reality. When inflation is low, its effects are minimal, and excluding it may be acceptable. When inflation is high, however, its effects are substantial, and a partial picture can lead to incorrect decisions. During such times, include it in the analysis.

There is no simple right or wrong regarding including or excluding inflation. Temper your decision with judgment based on knowledge of the current economy and the purpose(s) of your analysis.

A reasonable *guideline* is always to include inflation in your analysis. In choosing this approach, you must be certain when comparing analyses of several investments that they *all* include inflation. It is incorrect to compare analyses that include inflation to those that exclude it. The same rule holds if you choose to *exclude* inflation. Always be sure to compare like situations.

Obtaining assistance

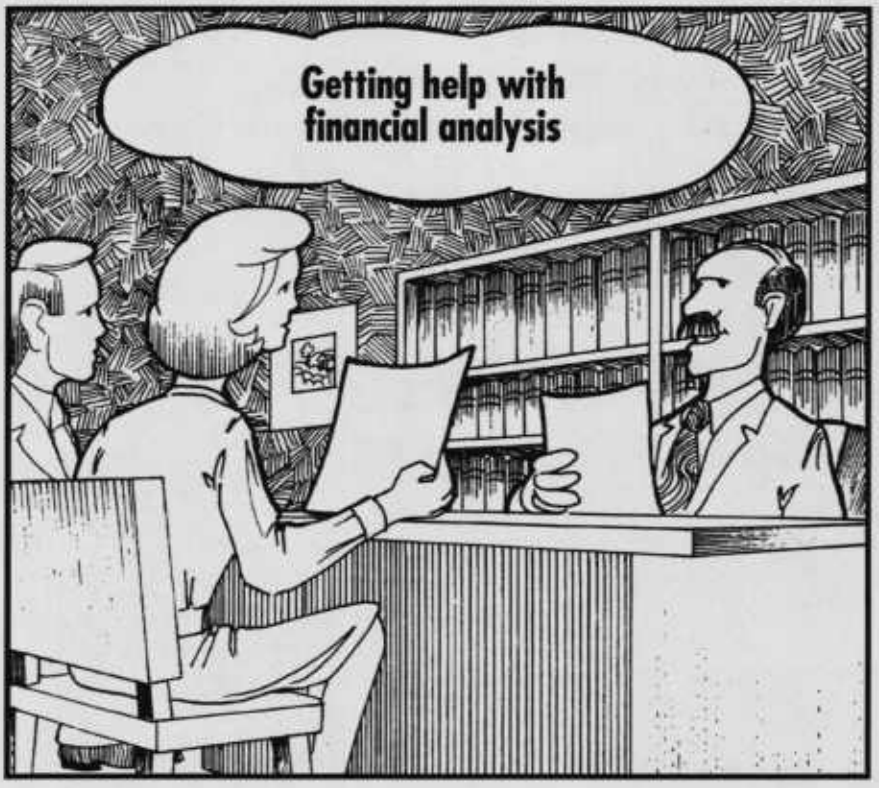
Where should you go for help? There are a number of sources. Your local Extension agent either has the knowledge to help you or can suggest some sources of help. Professional foresters, including consultants, are trained to evaluate forestry projects and can give assistance. You might try your banker or loan officer.

Real estate brokers and agents often have such training, some even in the specific area of forest land appraisal. Finally, don't forget about your friends and those in the Oregon Small Woodlands Association.

Conclusion

Landowners often wonder if financial analyses are really worth the effort—and if anyone ever uses them. While answering the first question is a personal judgment, the fact that they *are* used is clear. Land and timber appraisal—another form of financial analysis—is an everyday practice. Management planning and investment management for woodland businesses frequently require financial analyses.

Tax management, especially estate tax planning, uses data generated by financial analysis. Finally, when seeking credit, landowners must not only document their financial past but also project their future. A thorough financial analysis will organize and convey your plans effectively.



For further reading

OSU Extension publications

Elwood, N.E. and R.O. McMahon, *Forestry Financial Analysis II: Worksheets for How-to-Do-It,* EC 1147 (reprinted 1997). $4.50

Elwood, N.E. and R.O. McMahon, *Forestry Financial Analysis III: How to Compare Two (or More) Investments,* EC 1148 (reprinted 1993). $4.00

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The Woodland Workbook is a collection of publications prepared by the Oregon State University Extension Service specifically for owners and managers of private, nonindustrial woodlands. The Workbook is organized into separate sections, containing information of long-range and day-to-day value for anyone interested in wise management, conservation, and use of woodland properties. It's available in a 3-ring binder with tabbed dividers for each section.

For information about how to order, and for a current list of titles and prices, inquire at the office of the OSU Extension Service that serves your county.

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