

Cost/Benefit Analysis for Leasing Taps vs. Managing for Sawtimber Production

Michael Farrell, January 21, 2010

The following document describes the key variables in the decision of whether or not to lease a maple tree for tapping, harvest the tree immediately, or manage the tree for long-term commercial sawtimber production. A user can experiment with the spreadsheet, changing one variable at a time to see how the NPV analysis is affected. This document explains how changing the direction of any of the variables will affect the final analysis.

Tree Diameter

The smaller the initial diameter of the tree, the more likely it is that leasing for syrup production will be more profitable than managing for long-term timber production. From the forest owner's perspective, he/she should start leasing as soon as the tree is of minimum tapping size (conservative tapping guidelines state either 10 or 12" dbh whereas many producers will tap trees as small as 8" dbh). Smaller trees will not yield as much sap as larger ones, but since a landowner is paid by the tap and not the amount of sap collected, it really does not matter how much sap the tree actually produces.

Extent of Tapping Zone

The lower the height of the impact on the tree, the less impact on stumpage payments one can expect. Therefore, a landowner should request that a maple producer tap as low as possible, although in some years the snow depth necessitates high tapping.

Merchantable Height

How many possible sawlogs exist above the bottom 8 ft butt log will have an impact on the profitability of cutting immediately vs. leasing taps for many years and then cutting. If there are many sawlogs in a tree that is cut immediately, the additional stumpage value from those logs could easily tip the balance in favor of immediate timber production. However, if a pole sized tree is tall and straight with few lower branches, there are likely to be many sawlogs above the butt log once the tree reaches sawtimber size. In this case, delayed cutting will allow the tree to add significant value while allowing tapping will bring in revenues each year until the entire tree is ready to be harvested.

Growth Rates

Generally speaking, the slower a tree grows, the more likely it is that leasing taps will be more profitable than managing for commercial sawtimber production. This is due to the fact a landowner is receiving the same lease payment no matter how fast the tree is growing whereas the sawtimber value will increase rapidly if the tree is growing rapidly. For the same reason, if a landowner is considering harvesting a tree immediately vs. letting it grow for future sawtimber production, slower growth rates will also favor immediate cutting, especially when the trees are already above 16" dbh.

Stumpage Rates

The current and future stumpage rates for maple are highly volatile and largely unpredictable. The DEC publishes stumpage price reports twice a year, available at <http://www.dec.ny.gov/lands/5259.html>.

Price fluctuations have a strong impact on the timing and level of timber harvest. Factors that would favor leasing include 1. low stumpage rates for maple logs 2. low price differentials between tapped and untapped logs

Log Scale

The three commonly used log scales in NY are Doyle, Scribner, and International 1/4". I have used the formulas provided in Wiant, H. and Castandea, F. 1977. Mesavage and Girard's Volume Tables Formulated. Resource Inventory Notes No 4. March 1977. The Doyle scale is only used in the Eastern and Southern US- it underestimates board footage in small logs and overestimates in large logs. The Scribner rule is one of the oldest in existence; it assumes 1-inch boards and a 1/4-inch kerf, makes a liberal allowance for slabs, and disregards taper. The International 1/4-inch scale uses a 1/8-inch kerf and is based on an analysis of the loss of wood fiber incurred in the conversion of saw logs to lumber.

Since the International 1/4" estimates much higher volumes than Doyle or Scribner, using Int'l results in comparisons that favor immediate timber cutting over long term leasing. Doyle has the lowest estimates for bd ft volume whereas Scribner is much closer to the Int'l estimates. Therefore, using the Doyle scale is much more likely to result in comparisons that favor leasing taps while Scribner also has a slight advantage for leasing vs. Int'l.

Lease Payments

The higher the lease payment, the greater the likelihood that maple sugaring will be more lucrative than timber management over time. Also, the rate at which the payment increases over time will also affect the profitability

Diameter at which to start tapping and at which to add a second tap

The smaller the diameter of the tree when it is first tapped and when the second tap is added, the more profitable leasing will be for the landowner. Although overtapping could result in long-term declines in sap yield, it is very unlikely to kill the tree. Since a landowner normally receives the same price per tap no matter how much sap is produced, it is to the landowner's immediate financial advantage to start leasing trees as soon as possible.

Discount Rate

The rate used to discount future cash flows to their present values is a key variable of NPV analysis. Discounting future revenues is very important to equalize the revenue streams of leasing taps vs. managing for sawtimber production over time. Depending on the time horizon of the investment period and the year at which revenues appear, the discount rate that is applied will have a significant impact on the profitability of leasing taps vs. managing for commercial sawtimber production. Most landowners may consider using the alternative rate of return for their money as the discount rate when comparing tapping vs. timber over time. For instance, a landowner could cut a tree immediately and then put that money in an investment that will pay a certain rate of return each year (this anticipated rate of return is what should be used for the discount rate).

Generally speaking, the lower the discount rate, the more profitable leasing will be whereas high discount rates will result in immediate timber harvesting generating the highest NPV.

Agricultural Assessment

In New York State (and possibly others), landowners can receive an agricultural assessment and therefore reduced property tax payments by producing syrup themselves or leasing taps to another producer. The amount of tax savings will vary greatly depending on the assessed value of the forestland without ag assessment and the tax rate

for that particular town. The greater the difference between regular taxes and ag assessment taxes, the more profitable leasing will be.

Determining the impact of this savings is best done on a per acre basis, however this analysis is being done on an individual tree basis. It is worth noting that in NY, landowners with at least 50 acres of forestland can also qualify for a tax break through the 480-A program. This program favors timber production, although it is likely that leasing for syrup production would also qualify under the program. However, very few landowners enroll in the program, as it is much more difficult to qualify, is expensive to get started, requires paying an excise tax of 6% whenever trees are harvested, and contains much stiffer penalties for withdrawing from the program and/or not following the management plan. Agricultural assessment only requires leasing 7 acres of woodland, no management plan is required, and there is only a 5 year commitment with fewer penalties for withdrawing.

Time Horizon of the Investment Period

This is one of the most critical aspects of the leasing vs. timber management analysis. If one is looking for immediate revenues, cutting the timber will always be more lucrative for a landowner. However, the longer the time horizon a landowner is considering, the more likely it is that leasing taps will be more profitable. This is due to the fact that leasing taps results in annual revenues that are significantly lower than payments for timber harvesting; however, when added together these many small payments eventually add up to sums that are often times much larger than the stumpage payments.