Co-Harvesting Saw Logs and Smallwood Is Good for Your Bottom Line

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Note: *This bulletin is based on a technical report by Becker and others (2010. Productivity and economics of conventional logging with BMPs in co-harvests of saw logs and smallwood.). That report will be available at www.eofc.org to provide details of methods and results. The economics of timber harvest depend greatly on timber quantity and quality, timing of the sale, etc. so the information here is intended only to provide a starting point.*

Taking the long view

When you high grade, or cut the best and leave the rest, no doubt you can maximize your immediate profits. The smaller, supposedly younger trees left behind in such a diameter limit cut are expected to replace the harvested trees. This often won't happen because most of the small trees are actually as old as the cut trees and lack growth potential. So, over time, this sort of harvest degrades the forest.

What if there was an alternative that was also profitable and made you look good to the landowner so you'd be invited back sooner for more logging?

That alternative is crop tree management. In this approach, inferior, competing trees and those unlikely to survive to the next harvest are removed to concentrate resources on the crop trees. These are left to grow and increase in value. Such a harvest improves the health and earning potential of the forest.

Who's paying for this?

In the beginning especially, crop tree management involves thinning the forest by harvesting mostly smaller and low quality trees. Such trees take longer to harvest and are less valuable than saw logs so it was widely believed that this kind of harvest required subsidy to attract loggers' interest.

We wondered if some of the profit from the saw logs could pay for this sort of improvement harvest in exchange for higher future profits.

Four sets of landowners and loggers agreed to cooperate in our study. The landowners ranged from me, just getting started and with the poorest timber for harvest, to Mark Nussbaum, who practices the most intensive crop tree management in Missouri's Ozarks and was already on his third harvest.

Mark manages his family tree farm to produce grade and veneer instead of settling for tie logs. His conscientious efforts have paid off, and now he earns $55 per acre annually. This is shared with his logger.

All but one team of loggers were regional or state Loggers of the Year. They all practiced advanced harvest techniques such as directional felling to protect the leave trees. They also had figured out that smallwood made them money.

We measured the volume and revenue from all the timber harvested and the operating time of each piece of equipment. We calculated the cost per operating hour of the equipment from information supplied by the loggers, using standard procedures.

The landowner's profit was the stumpage paid by the logger for standing timber or progressive shares in Mark Nussbaum's case.[1] The logger's "profit" (technically, operating revenue) was the timber revenue less stumpage or shares and less the cost of harvest and delivery to the mill.

To make a long story short, all four harvests of just 17-28 acres were profitable to both the loggers and landowners. Loggers netted $240-340 per day, which provides a good living.

Thus, no one has to settle for clear cutting or high grading. Instead, you can set yourself up for higher future earnings by partnering with landowners to increase the growth rate and quality of their timber.

A big surprise

Unexpectedly, the smallwood paid for its harvest cost and did not require any subsidy. Smallwood (pallet, blocking, and pulpwood) was obtained from pole-sized trees, culls, and efficient

[1] Mark got $1/t for pulpwood, $30/mbf (thousand board feet) for pallet wood, $120/mbf for ties and #3 logs, $170/mbf for flooring, 60% of grade logs earning $171 to $999/mbf, and 75% of grade/veneer logs earning at least $1000/mbf.

use of top wood. Trees providing saw logs also furnished smallwood and made harvest of nearby pure smallwood trees cost-effective.

For half of the loggers, smallwood was more profitable than saw logs. This was because the loggers paid little or nothing to the landowner for the smallwood, typically just the stumpage for the pallet portion of the saw logs.

Regardless of its profitability relative to saw logs, smallwood earned loggers at least $9.50 per ton. They could have paid the landowner $5 and $4 per ton, respectively, for sold blocking and pulpwood, and still done quite well. Pioneer Forest, the largest private forest landowner in Missouri, received these rates in salvage harvests of storm-damaged timber.

With hindsight, we should have realized that there was no opportunity cost to taking the time to harvest smallwood in addition to saw logs. Many loggers are paid a fee to deliver saw logs to a mill, which pays the stumpage. These fees are typically $90-110/mbf, which works out to about $15-18/ton. That's much less than the $20-30/ton that pulpwood and blocking fetch without stumpage.

Protect the landowner's (and your) nest egg

Crop tree management focuses on the leave trees because they are more valuable than those harvested. You should encourage inexperienced landowners to get a trained forester's help in selecting the crop trees and then harvest in ways that protect the forest's productivity.

Control the direction of tree fall, using the open face, bore cutting technique where necessary so that the crowns of leave trees are not damaged. Some damage to the remaining trees from skidding out logs is almost inevitable, but this can be held to 10% or less by using harvest trees as bumpers along the skid trail.

Follow Best Management Practices (BMPs) during harvest. Especially important is the construction of water bars or similar structures on steep skid trails to prevent soil erosion. Their cost is minor at less than $5.50 per acre and may be shared with the landowner.

Skid trails and decks for stacking logs should occupy no more than 5% of the harvest area. Show the landowner that you care and earn additional income by offering to seed the decks and skid trails. These should be revegetated after use because trees can't grow or replace themselves without good soil.

Use a contract to protect yourself and the landowner by spelling out your mutual expectations. Being business-like is good business.

Get ready for biomass

So-called woody biomass will almost certainly include currently marketable timber such as the smallwood in this study. What we have shown is that conventional equipment could profitably and sustainably supply this feedstock for bio-energy.

Our loggers sold about 20 ton/acre of smallwood. If harvests occurred on a 20-year "rotation", this would work out to 1 ton/acre/year. Assuming, like the Missouri Forest Product Association (MFPA), that there would be a 30% participation rate by landowners brings us down to 0.3 ton/acre/year.

Although this is one third greater than MFPA's recent estimate for a 10-county woodshed centered on Salem, such a harvest rate would still be less that the net growth rate *on site*. In other words, this would be a sustainable harvest rate in terms of simple replacement.

Think twice before investing in equipment like a feller buncher and chipper. This combination is supposed to improve production through whole-tree harvesting which, however, will make it hard to avoid damaging crop trees. Landowners won't like this. In-the-woods chipping is 50% more expensive than stationary chipping at the end user and may require loggers to assume the associated capital risk.

Acknowledgments

Funding for this study was provided by Farmer Rancher grant # FNC07-651 from North Central Region – Sustainable Agriculture Research and Education and by Pioneer Forest, LLC to the Eastern Ozarks Forestry Council. We thank the landowners (P. Becker, M. Nussbaum, Pioneer Forest LLC, and K. Wolf, Jr.), the loggers (B&T Logging, D. Lindgren, R. and K. Tuttle, and Tuttle Brothers Logging), the foresters (M. Bill, M. Calvert, T. Cunningham, J. Jensen, M. Norris, and T. Thompson), and the economist (T. Bilek) whose generous cooperation made this study possible. T. Cunningham, H. Dorst, and R. Tuttle commented helpfully on a previous draft of this bulletin.