MFA Case History: Twenty-five Acre Northern Hardwood Stand in Eaton County, Michigan

The major woodlot on this property is about 25 acres of good hard maple and cherry with some other species thrown in for good diversity. It was managed as a sugar bush up until approximately 1950, when it was clearcut, leaving about seven hard maples per acre that were too small or too defective to cut at that time. The current owner acquired the land in 1980. Shortly after purchasing the land, he called on the Department of Natural Resources (DNR) for management advice on the woodland. The DNR forester advised that the timber had good commercial potential, but that the only recommendation at that time was to wait for it to grow.

The owner got into the waiting mode and, with the pressures and concerns of his professional career and raising a young family, he largely forgot about the woods. In 1999 he was startled by a knock at the door from a timber buyer who offered $40,000 for some of his trees. He gave the buyer permission to mark the trees he'd like to cut; then took a walk to look at the woods himself. He was shocked to find trees down everywhere – hardly what he had envisioned. Saddened and somewhat embarrassed by what he considered to be the deplorable state of his woods, he called a consulting forester to help him get it under management. The owner and the forester walked the woods together. The forester pointed out that the downed timber was the result of over-crowded pole-size trees undergoing the process of self-thinning. They looked at the trees marked by the timber buyer for cutting. Essentially all maple and cherry 18" diameter and larger were marked; and no lower valued beech, ash or basswood were marked. They stopped to talk in a patch of mixed beech and maple. All the maples and none of the beech were marked for cutting. "What will you be growing here if you follow this fellow's marking?" the forester asked. That thought hadn't occurred to the owner before, but it convinced him that this wasn't the direction he wanted to go. He hired the forester to make a thorough examination of the woods and bring back his recommendations.

The forester's examination produced a report showing trees per acre by size and by species and compared those to the levels recommended for best sustainable growth (a "q" factor of 1.3, in foresters' terms). This showed an over-stocking of trees in the 8" to 12" diameter classes that were mostly elm and ash. These were thinning themselves, resulting in all the downed trees. The owner and the forester agreed that a sale of pulpwood that focused on the over-stocked elm and ash should be the first order of business. An agreement was reached with Menasha Corp., of Otsego, MI, and the sale netted $3,000.

In the following year, 2001, a sawlog harvest was offered for sale. There were 216 trees with an estimated volume of 52,600 board feet offered. The strategy used in selecting trees for harvest was to first remove trees that were not expected to survive another ten years. Next, trees that were not expected to improve, focusing where possible on the low-value species such as beech, were selected to bring the basal area down to the target level. Markets were good at that time and the timber sold for $00,600. The plan was to conduct another harvest in ten years.

Following the sawlog harvest, a local firewood cutter was engaged to cut up the tops on shares with the landowner – one of every four truckloads went to the landowner. The result of this agreement was about 60 face cords of wood for the landowner, with an estimated value of $2,400.

In 2010 the same forester cruised the woodlot and recommended waiting another couple of years before harvesting again. The thick undergrowth of briars resulting from the previous cutting had not been completely shaded out yet. In 2012 the owner was concerned that his taxes on the timber income would rise substantially if the nation went over the "fiscal cliff"; so he asked the forester to do the second timber sale that fall. This time 365 trees were marked, with an estimated volume of 80,800 board feet. This harvest was designed to remove most of the remnant maples and the high-risk cherry trees, along with a few more of the low-value beech and other species. The high bid on this sale was $37,800, reflecting the somewhat poorer market conditions, compared to those in 2001.

Another sale is scheduled for about 2022. This one will remove most of the remaining remnant maples, the high-risk cherry, and some mature bitternut hickory. Following that sale the timber produced in this woods will be younger and more vigorous maple, cherry and bitternut.

Over the approximately 30 years of ownership of the 25-acre woodlot, he has earned nearly $84,000 from the timber.

Timber volume in 1999 was 7,800 board feet per acre. It dropped to about 6,000 after the 2001 harvest and climbed back to 8,800 in 2012. The 2013 harvest will drop per acre volume back to 5,600 board feet. Over the next decade, the volume will climb back up to 8,000 range. Growth has averaged about 300 board feet per acre per year.

Table 1. Management activities on 25 acre hardwood stand in Eaton County, Michigan.

Year	Item	Notes
@1950	Clearcut	
1980	Purchased	The landowner consulted with a DNR service forester who assessed the stand as "good" and recommended waiting for a harvest.
1999	Noticed a lot of pole-size down trees. Self-thinning occurring.	A logging company offered $40,000 for essentially all the hard maple and cherry >18" in diameter. The landowner and forester discussed management objectives with consulting forester and the landowner decided not to sell.
2000	TSI thinning	The forester marked the stand to remove overstocked elm & ash. The marked trees were sold to Menasha.
2001	Commercial Harvest	The forester marked some beech, basswood & hickory in the stand; a total of 216 trees, 52,600 board feet. The best maple & cherry were left to grow.
2002	Harvest Firewood	Firewood was produced from the tops remaining from the2001 sawtimber harvest. The yield was 60 face cords and the revenue was shared with the logger.
2010	Consultation	The forester again assessed the stand and recommended waiting a few more years for the next harvest. The landowner wanted to minimize the risk so the stand was marked in preparation for sale.
2012	Commercial Harvest	The forester marked a total of 365 trees for harvest containing 80,800 board feet. The remnant maples, high-risk cherry & mature bitternut hickory were also removed.

Table 2. Timber Management Revenue and Costs[1] Summary

Year	Item	Cost	Revenue	Note
2000	TSI	$(300)	$3,000	Turned down offer of $40,000; noted pole-size downed trees
2001	Harvest	$(4,060)	$40,600	Sale of marked timber, 52.6 MBF, 216 trees
2002	Firewood		$2,400	Contract on shares, 60 face cords
2012	Harvest	$(3,780)	$37,800	Sale of marked timber, 80.8 MBF, 365 trees
Annual	Property taxes	$(1,250)		

Table 3. Investment Analysis Summary

Present Value of Fixed Costs (Taxes)	Present Value Variable Costs	Present Value of Returns	Net Present Value
$(13,783)	$(2,020)	$20,198	$4,396

Assumptions for the Analysis	
Property Tax Inflation Rate	3%
Desired Rate of Return	4%

Conclusion: With a positive net present value of $4396 and using a discount rate of 4%, this investment earned over 4% rate of return for the landowner.

[1] Annual costs that are allocated to the timber management are property taxes of $1,250 per year. The other costs are the consulting forester's fees charged at 10% of the timber sale revenue. If the landowner did not live on the property he or she might have incurred travel costs to reach the property for periodic management visits.