



NORTHERN HARDWOOD NOTES

Growth And Yield For Managed And Unmanaged Stands

Yield tables were generated using STEMS (Stand and Tree Evaluation and Modeling System) developed by North Central Forest Experiment Station scientists. The data fed into STEMS came from real ¼-acre plots. The plots were selected to characterize 40-year-old stands that averaged 58 percent of basal area in red maple, 23 percent in sugar maple, and the remaining 19 percent in yellow and paper birch, ash, elm, and aspen. One projection was made for unmanaged stands and one for managed stands. The purpose was to compare the gains produced by bringing stands under management.

The management simulated by the STEMS model consisted of reducing each plot to 60 square feet of basal area at age 40 by thinning from below. At ages 55, 70, and 8520 percent of the basal area was removed. At ages 100 and 115 no thinning was simulated.

How Effective Was Management?

1. After one 115-year rotation the managed stands produced 26 percent (poor site), 18 percent (medium site), and 49 percent (good site) more cubic foot volume than the unmanaged ones.
2. The managed stands were larger in average d.b.h. by 5 inches (poor site), 7 inches (medium site), and 10 inches (good site) than the unmanaged stands.
3. The managed stands had 19 percent less basal area and 64 percent fewer stems per acre than the unmanaged stands.
4. The managed stands increased 23 percent in board foot volume on the good site, but only 2 percent on the medium site, and none on the poor site. Why so little volume gain? Partly because so little board foot volume is thinned out of the stands on poor and medium sites. Also, the unmanaged stands would retain many small-diameter trees whose total board foot volume would equal that of managed stands having larger but fewer trees.

Reference

Belcher, David M. The users guide to STEMS: Stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-70. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1981. 49 p.

H. Michael Rauscher