 Investing in Forest Management

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Red pine (Norway pine), Minnesota’s state tree and backbone of Minnesota’s sawmill industry, has consistently been the most planted tree in Minnesota. Compared to aspen, Minnesota’s most prolific and harvested species, red pine can grow more than twice as fast. And red pine stumpage prices per cord are more than double those of aspen. Many view red pine as defining of Minnesota’s northwoods and lakeshores.

Background

The following is a brief summary of estimated statewide forest conditions developed from recent USDA Forest Service inventories. Readers can develop additional summaries via http://apps.fs.fed.us/Evalidator/evalidator.jsp.

On timberland, red pine comprises less than 5% of all trees over 5 inches in diameter at breast height (dbh). Over 77% of these red pine trees are estimated to be in stands that show clear evidence of artificial regeneration. Historically, red pine regenerated naturally after fire. With fires now greatly suppressed, red pine generally depends on artificial regeneration (planting).

Statwide inventories show that the number of large red pine trees has increased substantially on timberland. Comparing 1999-2003 and 2009-2013 inventories, the number of red pine trees over 11 inches in dbh increased by over 50%. However, there is concern that we are not regenerating enough red pine. Planting is a long-term investment – difficult to do extensively under tight budgets. And recent increases of older red pine on the landscape somewhat mask longer-term concerns. The figure below shows the most recent statewide estimate of the number of red pine trees by diameter at breast height (dbh) class for smaller trees in stands artificially regenerated.

The graph strongly suggests that investments in red pine reforestation have declined substantially statewide in recent years. Generally, for a steady-state (sustainable) condition for red pine, we need many more trees in the smaller diameter classes for the diameter classes shown above -- because some trees die before growing larger, and because trees in these dbh classes grow faster in diameter as they get larger, thus spending less time in each successive diameter class.
Current Research

At the University of Minnesota’s North Central Research and Outreach Center (NCROC), we are studying red pine management at multiple scales:

A. Transitioning red pine plantations

At the stand level, can we harvest red pine plantations to capture most economic returns while still retaining large overstory trees for the future? The next rotation might emphasize white pine in the understory with large red pine overstory trees providing environmental benefits plus helping protect the understory from white pine weevils. Harvesting much of the red pine overstory will provide economic returns and increase light to the understory, thus helping younger trees grow faster to get above deer browsing sooner. Intent is to mimic natural regeneration that occurs after fire. A mixed species understory may help make the stand more resilient for uncertain future climate change. Results will help us better understand how red pine plantations might help for establishing more white pine on the landscape. Implementing tests at NCROC offers opportunity to utilize forestry faculty and forestry students of Itasca Community College.

B. Recognizing Allowable Cut Effect (ACE)

Minnesota may be substantially underutilizing red pine planting opportunities if we don’t consider forest-wide impacts of investments. From strictly a stand-level perspective, long rotation lengths and high upfront planting costs can make reforestation investments appear marginal. However, we live in a world with forest-wide concerns. Large public landowners in Minnesota are holding relatively slow-growing stands for future harvest to help achieve more of a balanced forest-wide harvest flow of timber over time. Investing in more red pine reforestation would increase growth rates and future harvest potentials, thus potentially raising sustainable forest-wide harvest levels relatively soon. This potentially increases the system-wide value of reforestation investments substantially. We, at NCROC, are looking at system-wide impacts in detail.

Overall, Minnesota can benefit both economically and environmentally with a better understanding of forest investment opportunities. Through effective forest management investments, we can increase sustainable harvest levels that are critical to forest industry, while also helping improve important environmental conditions.