Project Impacts

Recommendations for Using Shelterwood Silviculture to Regenerate Eastern White Pine

PROJECT AWARD YEAR AND TITLE:

2010
Predicting Dynamics of Eastern White Pine (Pinus strobus L.) Advance Regeneration under Shelterwood Silviculture

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Eastern white pine is an important commercial tree species throughout northeastern North America. While white pine weevil damages pine in open stands, overstory canopies with 50 to 75% openness allows pine sapling growth with tolerable damage. With the prevalence of pine regeneration across Maine, foresters would benefit from tools to successfully regenerate pine. Successful management of white pine is accomplished through shelterwood silviculture, or removing overstory trees in a series of harvests designed to grow a new stand under the shelter of remaining trees. Information is lacking on pine growth under various overstory densities and timing of overstory tree harvest.

NSRC researchers measured trees in nine white pine stands in central Maine. Using fisheye photography, they analyzed overstory canopy openness. Computer modeling, using pine height growth and canopy openness data, allowed researchers to estimate time required to grow pine saplings to six meters in height based on overstory density. Researchers recommend that once pine regeneration reaches six meters (one commercial log), overstory trees should be harvested. Foresters can see the implications of leaving increased overstory density on the landscape now and make informed harvesting decisions ahead of time.

Researchers evaluated the small tree height growth model of the Forest Vegetation Simulator: Northeast Variant (FVS-NE) used from Maine to West Virginia, despite large differences in tree species' growth capabilities across this geographic range. Study findings show drastic under-prediction of height growth when growth exceeds one foot per year. To improve modeling capabilities for users of the software who manage for white pine, development of a Maine-specific variant of FVS is underway.