Project Impacts

NSRC-FUNDED RESEARCH FINAL REPORT

Influence of Tree Form on Commercial Hardwood Growth, Survival, Volume & Biomass

PROJECT AWARD YEAR AND TITLE:

2014

Assessing the Influence of Stem Form and Damage on Commercial Hardwoods Growth, Volume, and Biomass in Maine

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Northern hardwood tree species display a wide variety of stem forms and defects which can considerably reduce stem quality and complicate the management objectives of these species. However, managers rarely quantify hardwood stem form and vigor in routine forest inventories despite their significant influence on important tree attributes like growth, survival, and wood volume. To address this, NSRC researchers measured standing hardwood species on continuous forest inventory plots in Maine and New Hampshire using a classification system developed by the Northern Hardwood Research Institute of New Brunswick to classify stem form and risk.

Using the standing tree data, researchers conducted regression analyses to predict the influence of stem form and risk on potential sawlog recovery, annual tree diameter growth, and probability of survival. In addition, they assessed various species-, climatic-, and tree-level factors to determine which had the greatest overall influence on wood decay prevalence. They incorporated resulting equations into the FVS-ACD model to quantify the impact of form and risk on future projections of sawlog value.

Overall, results from this study indicated that stem form and risk have important implications on growth and yield as well as on internal stem quality for hardwood species. Long-term simulations using FVS-ACD indicated that forecasted stand level sawlog value was 16 to 28% lower when stem form and risk were accounted for, depending on the percentage of non-ideal hardwood stems in a stand. Thus, inclusion of stem form and risk in growth and yield models can enhance forecasting of forest resources by improving predictions of product potential, growth, and survival.

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