

QUANTIFYING POTENTIAL COSTS AND BENEFITS OF ALTERNATIVE OAK MANAGEMENT REGIMES IN THE CENTRAL HARDWOOD REGION OF THE UNITED STATES

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Both the regionwide studies as well as isolated case studies of historically oak-dominated stands in the Central Hardwood Region (CHR) indicate abundant stocking of large-sized trees and dearth of small-sized trees with proliferation of fire sensitive species such as maples and beech in sapling and pole stages. Exacerbating the status quo of oak forests in the region are pervasive harvesting practices such as high-grading, with active forest management largely absent in the hardwood growing region. In this study, we posited that a mix of forest management practices geared towards making oaks more competitive: crop tree release, clearcutting, or shelterwoods, would have 2-fold impacts in the long run, to 1) meet the ever-growing demand of high-quality timber while maintaining a sustainable oak resource base; and 2) enhance (or not) the carbon capture potential of these hardwoods. To this end, our study linked growth and yield curves under a suite of management scenarios from the U.S. Department of Agriculture, Forest Service, Forest Vegetation Simulator with a detailed intertemporal optimization model of the U.S. forest sector to assess implications of alternative management strategies to mitigate mesophication impacts in the CHR. Further, results were used to quantify market thresholds or policy inputs needed to incentivize management techniques that improve the long-term sustainability of hardwood systems in the region, while recognizing potential near-term tradeoffs from different management techniques.

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