

# INCREASING STRUCTURAL AND SPECIES DIVERSITY OF NORTHERN HARDWOODS WITH SILVICULTURE

## A McIntire-Stennis supported project



Michigan Tech  
School of Forest Resources  
and Environmental Science

The goal of this project was to evaluate the immediate ecological sustainability and economic feasibility of a suite of forest management treatments in the northern hardwood forests of the Lake States, with the aim of successfully regenerating the forest with diverse tree species and augmented landscape-scale forest complexity.

Currently, the majority of northern hardwood forests in the Lake States managed for timber production are managed using uneven-aged silvicultural systems that maintain forest cover in the long-term by frequently harvesting relatively few trees.

This project investigated the regeneration of northern hardwood forests using patch clear-cutting, shelterwood, and irregular shelterwood silvicultural systems with silviculture paired with mechanical and simulated tree up-rooting site preparation methods. The understanding of these different approaches will provide greater options for the management of northern hardwoods of the Lake States that promote a diversity of tree species and forest structures, deliver recommendations for reliable even-aged regeneration systems in this forest type, and increase our understanding of forest successional pathways.



### About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.



### COLLABORATION

Experimental treatments were implemented with the assistance of J.M. Longyear LLC., and Hiawatha National Forest.



140,000

acres similar forest under management by J.M.Longyear

### IMPACT

Developing alternative forest management approaches to achieve greater species diversity and forest complexity will promote the tailoring of silvicultural prescriptions to the specific context of each forest stand.



270

students and forest managers educated in field site visits



10 Students

Ph.D students and undergraduate technicians received education and mentorship through work on this project



\$500K

Value of research funded by National Institute of Food & Agriculture which expand on this study