

Stocking Levels in Second-Growth Hardwoods



“Ecology and Silviculture of Northern Lake States Forests”

A research work unit of the USDA Forest Service North Central Research Station

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Study Briefing

Established 1954, Dukes Experimental Forest, Michigan

Purpose: In 1954, about 2.5 million acres of the northern hardwood type in the Upper Peninsula of Michigan were second growth. These second growth stands were the results of clear-cutting in the virgin hardwood stands. They had many undesirable silvicultural characteristics that prevented maximum quantity and quality growth. Private landowners, national forests, and industry were just becoming aware of this new source of timber as potential high-quality material and a possible current source of low-grade material, such as chemical wood, railroad ties, pulpwood, etc. The potential of this resource brought on the need to understand how to manage second growth.

The purpose of this study was to investigate the economic and silvicultural factors involved in managing second-growth hardwoods in the Upper Peninsula of Michigan.

Objectives:

1. To test whether even-ages or all-aged management will give the best growth and quality in the two types of second-growth hardwoods resulting from different initial logging utilization in the Upper Peninsula of Michigan.
2. To test the growing stock level best suited for growing high-quality veneer and sawlog material and also the one suited for highest wood production under even-aged and all-aged management systems.
3. To test the economic feasibility of the various methods of cutting. That is, will the returns from the materials produced give sufficient income to pay the costs of cutting? Do the products have any stumpage value?

Study Design:

The experiment uses a split-plot block design, consisting of three blocks and four stocking level treatments that are split between even-aged and all-aged management. The stocking levels are 40, 60, 80, and 100 ft²/acre. Treatments are 7 acres in size.

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Research History:

Treatment were applied every 10 years until 1972. The trees were measured at five year intervals until 1972 as well.

Investigators:

Original: C. A. Arbogast

Current: Christel Kern and Brian Palik, NCRS