

STRUCTURAL CHANGE OVER A HALF CENTURY
IN AN OLD-GROWTH, OAK-HICKORY FOREST
IN INDIANA

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Abstract

The Davis-Purdue Natural Forest, located 13 miles northeast of Muncie, Indiana, is one of the largest remnant's (20.6 hectare) of wet-site, oak-hickory forest found on the intensively farmed Tipton Till Plain. Since its acquisition in 1917 by Purdue University the forest has had minor disturbance. It is recognized as a Registered National Landmark by the National Park Service.

An unpublished Purdue Study was made of the forest in 1926 by Burr N. Prentice. All trees 10 cm or greater at dbh were numbered, tagged, described in detail, and plotted on a large scale map. The interior 8.5 hectares were reexamined in 1976 with similar scrutiny. Both sets of data were placed on a coordinate system for computer mapping and analysis of structural change.

This forest is still recovering from livestock grazing prior to 1926. This is indicated by greatly reduced densities of the smaller size classes in 1926 compared to 1976. Ingrowth in response to protection from grazing resulted in a 91 percent increase in density (166 to 318 trees/ha) over the 50 year period. Basal area also increased (24 to 31 m²/ha) due to increased density and to growth of residual trees.

Analysis of survival and ingrowth by species indicates this forest is undergoing a rapid change in composition. All oak species, Fraxinus americana and Juglans nigra decreased in density while all species of maple, hickory, and elm increased in density between sample periods.