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The *Butler University Botanical Studies* journal was published by the Botany Department of Butler University, Indianapolis, Indiana, from 1929 to 1964. The scientific journal featured original papers primarily on plant ecology, taxonomy, and microbiology. The papers contain valuable historical studies, especially floristic surveys that document Indiana's vegetation in past decades. Authors were Butler faculty, current and former master's degree students and undergraduates, and other Indiana botanists. The journal was started by Stanley Cain, noted conservation biologist, and edited through most of its years of production by Ray C. Friesner, Butler's first botanist and founder of the department in 1919. The journal was distributed to learned societies and libraries through exchange.

During the years of the journal's publication, the Butler University Botany Department had an active program of research and student training. 201 bachelor's degrees and 75 master's degrees in Botany were conferred during this period. Thirty-five of these graduates went on to earn doctorates at other institutions.

The Botany Department attracted many notable faculty members and students. Distinguished faculty, in addition to Cain and Friesner, included John E. Potzger, a forest ecologist and palynologist, Willard Nelson Clute, co-founder of the American Fern Society, Marion T. Hall, former director of the Morton Arboretum, C. Mervin Palmer, Rex Webster, and John Pelton. Some of the former undergraduate and master's students who made active contributions to the fields of botany and ecology include Dwight W. Billings, Fay Kenoyer Daily, William A. Daily, Rexford Daudenmire, Francis Hueber, Frank McCormick, Scott McCoy, Robert Petty, Potzger, Helene Starcs, and Theodore Sperry. Cain, Daudenmire, Potzger, and Billings served as Presidents of the Ecological Society of America.

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CHARACTERISTICS OF THE ORIGINAL VEGETATION IN SOME PRAIRIE COUNTIES OF INDIANA¹

By DEAN FINLEY AND J. E. POTZGER, Butler University

During the century since civilized man brought great change to the natural vegetation of Indiana by lumbering and farming, the prairie suffered perhaps more than the forest. Agriculture and drainage modified these habitats greatly. An attempt is therefore made to reconstruct the pattern of the original distribution of grasslands in Indiana. Rohr and Potzger (2) described and discussed three northwestern Indiana prairie counties and the present study concerns itself with the prairie-influenced counties to the south and east of those described previously. In the five counties presented in this study the mesophytic forest was almost entirely inhibited and the most favorable areas were occupied by xeric oaks, or oaks and hickories, and even such forests could not always produce a closed canopy.

METHODS

Data were taken from the records of the original U. S. land survey in Warren, Benton, White, Pulaski, and Starke counties. In locations where the surveyors' notes listed posts, the habitat was assumed to have been favorable to prairie, besides, it was usually designated by the surveyors as wet or dry prairie. Figure 1 presents the outline of the counties and the original vegetation patterns. In order to show as a unit the counties in which prairie was conspicuous, we have included in figure 1 the counties described by Rohr and Potzger (2), i. e. Lake, Newton, and Jasper counties.

Distribution of prairie was taken from the surveyors' placement of posts and from their descriptions of the smaller areas rather than

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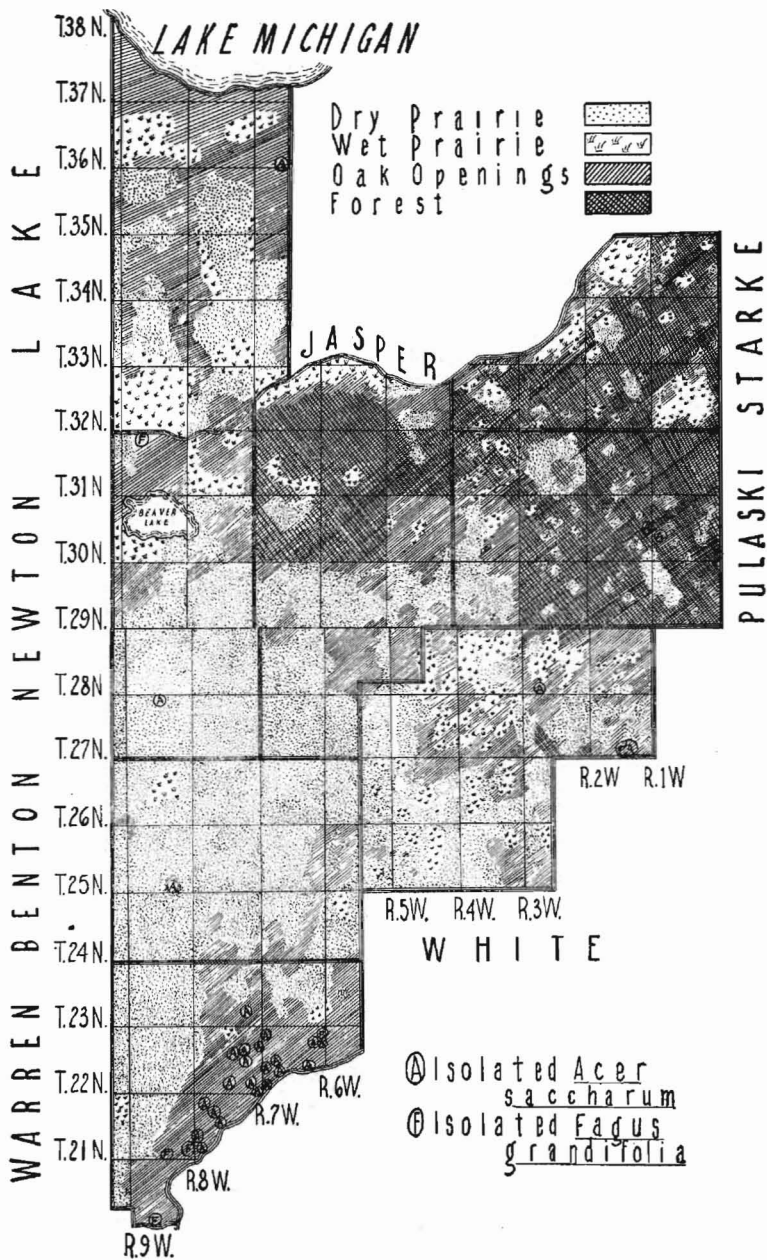


FIGURE 1

Diagrammatic representation of distributional patterns of the original vegetation in eight Indiana "prairie" counties.

from the notes describing whole townships, because the latter appeared to be highly generalized. The oak-opening type forest was based on reduced number of stems listed and on descriptions of the forests.

OBSERVATIONS

The counties included in this study were not all uniform with respect to natural vegetation, as figure 1 plainly shows. Prairie, oak openings and oak forests alternated in larger and smaller areas. At times whole townships were involved in a single "patch." Only Benton County was predominantly prairie. The number of tree species which participated in the forest cover varied greatly too from county to county. Benton 11, White 29, Starke 28, Pulaski 34 and Warren 34. The forest in the whole area was composed chiefly of oaks. *Carya* (hickory) is significant only in Benton County, while all other counties were 85 to 100 per cent oaks. Abundance of the various species of oaks reflects somewhat their importance in the forest composition:

Species	Benton	Warren	White	Pulaski	Starke
White oak (<i>Quercus alba</i>)	21	263	521	1157	833
Bur oak (<i>Q. macrocarpa</i>)	29	36	41	83	15
Jack oak (<i>Q. ellipsoidalis</i>)	11	14	75	19	—
Black oak (<i>Q. velutina</i>)	11	27	177	770	393
Yellow oak	—	30	30	254	115

Of the northern evergreens *Larix* was reported for Pulaski and Starke counties. *Thuja occidentalis* for Pulaski County, and *Pinus* sp. for Starke County (T. 34 N., R. 1 W.).

The most outstanding characteristic of the distribution pattern of prairie and forests is no doubt the result of smaller or larger microclimatic areas, which favor first one and then the other vegetation group. Importance of microclimate is emphasized especially by the invasion of *Acer saccharum* and *Fagus grandifolia*. Outside of a few isolated places, these species invaded along river courses (Fig. 1). Along the western border of the five counties the forest occupies smaller patches of more favorable soil moisture, and along the eastern border the dominance is reversed, here the prairie is distributed in numerous scattered places.

DISCUSSION

For the ecologist there is perhaps no more fascinating pattern of habitats than in an ecotone. Struggle is here emphasized and stately forests may be held in check by grass vegetation, or, at best, they can establish themselves only in small oases of more favorable edaphic conditions. A sharp differentiation is also made between the xeric oaks and hickories and the mesic beech and sugar maple. The latter two species have barely invaded the five counties included in this study. Sugar maple, here too, as in the rugged sections of the state, is more capable than beech to ecese in dry habitats, as Potzger (1) has described for Ripley County.

There is no doubt that forests in the ecotone are usually not so dense as in habitats favoring forests, but it is a little difficult to draw a sharp line between open-crown and closed-crown forests when the bases for such differentiation are mere descriptions or records of witness trees. Nevertheless, Figure 1 makes this differentiation on basis of number of stems recorded in the various townships. In some instances the surveyors made specific mention of the "scattered" tree population, but unfortunately this was not done consistently.

It should, perhaps, be emphasized again that the large areas listed as "wet prairie" very likely were chiefly sedge-meadow. This certainly must have been true along the borders of streams like the Kankakee River. The most significant contribution which this paper aims to make is the pointing out that according to the old survey records the Indiana prairie counties constituted primarily an ecotone between forest and prairie. Extensive areas of prairie were limited to Benton and Newton counties, and about half of Warren and White counties. From here eastward grasslands became more and more fragmented until forest became the controlling vegetation cover. This is more clearly shown in figure 1 than a description could ever accomplish.

SUMMARY

1. The paper presents prairie conditions in five northwestern Indiana counties (Benton, Warren, White, Pulaski, Starke), using as basis the reports of the original U. S. land survey.

2. Wet and dry prairie are mentioned by the surveyors. The probability is expressed that wet prairie may really be sedge-meadow.

3. Outside of Benton, Newton and half of White and Warren counties, distribution of vegetation suggested an ecotone complex rather than that of a prairie. Microclimate very definitely made a heterogeneous selection of forest and prairie patches.

4. Along the southern border of Benton County forests invaded in broad belts along river valleys and to a lesser degree in isolated scattered small patches.

5. Eastward in Pulaski, Starke counties conditions favored the forests and prairie "exploded" into numerous small patches, and forest changed from oak openings to closed-crown forest.

6. Oaks constituted the dominant trees in the five counties, totalling in some areas 85 to 100 per cent of the stems. Oak-hickory association appeared only in the scattered open forests of Benton County.

7. White oak totalled more than 50 per cent of the stems of the several species of oaks represented in the forests.

8. The graphic presentation of distribution of prairie and forest (Fig. 1) clearly portrays the region as one of habitat stresses where microclimate determined distribution of forest and grassland in a highly disjunct pattern.

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