STRATEGIC HABITATS AND COMMUNITIES IN ILLINOIS

BY

A. G. VESTAL,

University of Illinois, Urbana

INTRODUCTION

This paper is intended to be a roll-call of areas in Illinois which are of more than ordinary interest to biologists, either because of local peculiarities of habitat or history which favor the presence of less common plants and animals, or because of particularly good preservation of original conditions and the original communities. Its primary purpose is to appeal to those who may know of similar localities to bring them to the attention of others, so that all of us may know of their existence and visit them as we can, for scientific study, for instituting measures which may lead to their continued preservation, for field study by classes of students, and for the enjoyment which rewards the biologist who can appreciate the significance as well as the beauty of the native vegetation in its original setting. It is suggested that such localities be reported to the Academy's Committee on Ecological Survey, or to the Committee of the Ecological Society of America which is working to preserve such areas of natural conditions. The chairman of this committee is Dr. V. E. Shelford, Vivarium Building, Champaign, Illinois. It happens that one of the present activities of this committee is the selection of notable areas which are so located that each can be visited by classes from two or more colleges or universities. It is entirely possible that correlated efforts of several of these institutions may result in long-term lease or in purchase of selected tracts of land for study purposes.

Aquatic habitats and communities are not included in this list. The land areas of original conditions included prairie, almost entirely confined to flat or rolling uplands, forest of a number of types, chiefly developed on moraines or in stream valleys and in places spreading extensively from these over the general surface. Inasmuch as glacial till with silt-loam soil and heavier subsoil covers most of the area, it follows that the non-glaciated areas, and coarse soils (sand or gravel) or rock outcrops, provide the chief departures from the relatively uniform substratum which prevails over any extensive part of Illinois.

Furthermore, areas of more rugged topography are of interest because they are so much less extensive and because they provide greater diversification of habitats and of vegetation.

In the list which follows, *types of habitat* or *community* are printed in italics. Representative localities are mentioned under each type. It is particularly hoped that readers of this list will supply information as to other examples of such habitats and communities, to the author, to Dr. Shelford, or to any member of the Academy's Committee on Ecological Survey.

Habitats Notable Because of Topography or Substratum

Ravines with rock outcrop. These include the canyons of Starved Rock (Sauer, Cady, and Cowles, 1918; Thone, 1922), and smaller canyons along lower Fox River; Apple River and other canyons in northwest Illinois (Pepoon, 1909), and local rock canyons of tributaries of Rock River (DeForest, 1922); Rock canyon on Rock Creek on the north side of Kankakee River; Rocky Branch, Big Creek, northern Clark County (Stover, 1930); many steep ravines in the bluffs of the Mississippi, with rock outcrops at the base of bluffs. Residual soil overlying rock is also of interest. It is very local in occurrence and is found near rock outcrops in the larger valleys.

Gravelly knolls and other coarse-soil areas. Prickly-pear cactus has been reported from a gravelly knoll north of Laclede in southeastern Fayette County and in gravel of the lower Wabash valley. Other xeric plants are presumably there also. The prickly pear is likely to serve as an indicator of coarse soil; the places in which it occurs in southern Illinois should be made known.

Sand areas. Recent invasion of black oak occurs on most of the sand ridges in the Kankakee area, yet the sand-prairie flora remains, with patches of sand-prairie vegetation. The more extensive areas of sand-prairie near Illinois River, with blowouts and dunes, are fortunately not easily amenable to agriculture and therefore of low value, so that their purchase should be feasible. The Devil's Neck, north of Topeka in Mason County, should be acquired, together with nearby areas covered with scrub oak. Two sand areas in the Kankakee valley are especially notable, one west of Kankakee, the other east of St. Anne. The sand areas of the Wabash valley, although small, scattered, and mostly used for cultivation of melons, may still include a few places with native vegetation. Allison Prairie, noted by Eaton (1931:150) is one such area to examine.

Mixed sand-and-loess deposits. These are found at the leeward edge of valleys of the Illinois and Mississippi rivers, at the base of bluffs, and even upon bluff-tops. They exhibit a type of prairie intermediate between sand-prairie and that of the finer soils.

Prairie in the broad valleys of the larger rivers. Remnants of native prairie vegetation are known to occur in the Mississippi valley of northern Illinois, they are less well represented in the Illinois River valley, and have recently been observed in the lower Wabash valley.

Prairie sloughs. Once the prairie sloughs covered a large proportion of the treeless areas, but now they are mostly drained and farmed. Some of the few which are still in the original condition should be made known and preserved.

Bogs of several types. Former river-beds filled in with deep peat occur near Fulton in Whiteside County, and near Manito in Mason County; a few bogs scattered over the prairie areas, and the numerous bogs of northeastern Illinois (Waterman, 1922) offer possibilities. Gates' account of the Beach area (1912) includes descriptions of the bogs and marshy habitats, and he has also called attention to a bog near Matanzas on Illinois River (1911).

The higher and more rugged moraines, as in northeastern Illinois, and parts of the Shelbyville moraine, are likewise of interest, together with the scattered hills of the Old-Morainal Border extending southwestward from the Shelbyville area. Fink has given a brief description (1906) of eskers in Kane County.

Limestone areas with sink-hole topography, which occur southeast of St. Louis, may show few peculiarities of either flora or vegetation, yet they should be investigated, and perhaps efforts should be made to establish one or two preserves of this type.

Non-glaciated areas of the Ozark Hills will certainly be well represented in the State Parks and State and National Forests established already and in the future. The lower hills which interrupt the floodplain south of the Ozarks are less well known. Northwestern Illinois is likely to be represented before long in the State Park system.

Areas Notable Because of Vegetation

Forest islands in prairie. These isolated groves are of two types. The first originates from wind-blown or bird-carried seeds of trees; elm is usually the first tree to be established, hackberry is likely to be an early second. Walnut and hickory, perhaps planted by Indians,

also form a component of these forest islands. Oaks (except shingle oak and pin oak) are rarely present. Linn Grove (Champaign County) described by Gleason (1913) and Round Grove (north of Casey in Clark County; Vestal 1920:243) may serve as examples. The second type of grove, with the oaks present in normal abundance, represents a relict area once part of a larger forest tract, the connection since having been destroyed, probably in all cases by prairie fires. Bur Oak Grove (eastern Champaign County, Gleason, 1912) and probably Charter Grove in DeKalb County, represent this type. The several rather large forest areas of McLean County, now isolated from one another, may once have been connected. They occur on moraines, and whereas much more of the morainal area may once have been wooded, the present forests are chiefly on the more rugged parts of the moraines where the larger streams intersect them. Other small groves, mostly of the first type, are mentioned by Gleason (1913:177) in DeWitt, Macon, Moultrie, Piatt, and Shelby counties. The writer has studied them in Cumberland, Coles, and Douglas counties. There must be others whose existence and character have not yet attracted notice.

Prairie islands in forest. Some of these are merely pinched-off salients of prairie which have become surrounded by the invading upland forest as an incident to its irregular spread. Others, mostly quite small, owe their preservation to some xeric exposure or to a locally coarse or exceptionally well-drained substratum. The larger islands of the first type, as represented in western and southern Illinois, will be particularly helpful in determining the original character of prairie in those parts of the State. Local prairie inclusions of the second type have been noted in the forest belt of the Embarrass River and other parts of eastern Illinois (Vestal, 1919a; see also Shimek, 1910, and Moseley, 1928).

Recent invasion of prairie by forest. In northwestern Indiana, bur-oak groves adjoining prairie have recently been shown, from their slight modification of dark soils, to have succeeded prairie—probably within the last hundred years. Similar bur-oak forests are likely to be found in northeastern Illinois and it may well be that many of the pure stands of bur oak on moraines of this area are likewise very recent. Black-oak dunes of the Kankakee and Winnebago areas are not only recent, but the invading process is still active, and can readily be seen and studied. Similar forest spread in the Illinois River sand is particularly rapid, with blackjack oak as well as black oak.

The projecting ends or salients of uplands, as found between the ravines at the borders of the larger stream valleys, are favorite areas

for invasion of prairie by upland forest. Elm, hackberry, shingle oak, and honey locust are among the invaders wherever drainage is not good. The white oak is notably absent from such areas. The effect of such invasion of upland salients is to rectify and shorten the boundary between forest and prairie (Vestal, 1920:236). It is well shown on the east side of Embarrass River in Cumberland County.

Recent invasion of forest land by prairie. Where railroads cross forest belts of stream valleys, the right-of-way has been invaded in many places by prairie. Examples have been seen near Charleston (Embarrass River forest belt, Vestal, 1919b); near Mahomet (Sangamon River); at various places in Shelby, Fayette, and Montgomery counties; and as far east as Crawfordsville, Indiana. The best of these places should be preserved by an arrangement with the railroads. Some of them show interesting admixtures of forest herbs with prairie plants. Shimek (1913) has described succession to prairie along a broad roadway through an Iowa forest.

No examples of cutover forest lands or of originally forested strip-mine areas which have been revegetated by prairie, have ever been noted in Illinois but the discovery of such a condition is by no means impossible. A few places have been seen in which prairie bunch-grasses have taken possession of the sites of abandoned farm-houses. Prairie plants are found along with the weeds which come up on strip-mine ridges. Usually the pioneer herbs are replaced by trees after a few years, but at Fairmount quarry, in an extensive prairie upland in Vermilion County, strip-mining for limestone has left ridges on which no trees are establishing themselves. Probably blue-grass will in time dominate. The partially flooded bottom of this large quarry is of interest chiefly because of its bird and other animal life. Several strip-mine areas and quarries offer possibilities as nature preserves.

The above survey of the less usual habitats and communities does not attempt to list known stations of the more nearly typical upland prairie, nor the common types of forest of upland, ravine-slopes, and bottomlands in various parts of Illinois. The appeal for information as to localities, however, does cover these more familiar communities, and it is hoped that readers will send to the author the descriptions of all notable areas, together with fairly explicit statements of location, and directions for reaching the stations. It is hoped that the Committee on Ecological Survey will thus be enabled to publish a report which will form a comprehensive Naturalists' Guide to Illinois.

REFERENCES

DEFOREST, H. The plant ecology of the Rock River woodlands of Ogle County, Illinois: Trans. Illinois Acad. Sci., Vol. 14, pp. 152-193, 1922.

EATON, S. H. The ligneous flora of Lawrence County: Trans. Illinois Acad. Sci., Vol. 23, pp. 149-159, 1931.

FINK, BRUCE. Floristic notes from an Illinois esker: Iowa Acad. Sci., Vol. 13, pp. 59-63, 1906.

GATES, F. C. A bog in central Illinois: Torreya, Vol. 11, pp. 205-211, 1911.

GATES, F. C. The vegetation of the Beach area in northeastern Illinois and southeastern Wisconsin: Illinois State Lab. Nat. Hist., Bull. 9, pp. 255-372, 1912.

GLEASON, H. A. The vegetation of the inland sand deposits of Illinois: Illinois State Lab. Nat. Hist., Bull. 9, pp. 21-74, 1910.

GLEASON, H. A. An isolated prairie grove and its phytogeographical significance. Bot. Gaz., Vol. 53, pp. 38-49, 1912.

GLEASON, H. A. The relation of forest distribution and prairie fires in the middle west: Torreya, Vol. 13, pp. 173-181, 1913.

MILLER, R. B., and FULLER, G. D. Forect conditions in Alexander County, Illinois: Trans. Illinois Acad. Sci., Vol. 14, pp. 92-108, 1922.

MOSELEY, E. L. Flora of the oak openings west of Toledo. Proc. Ohio Acad. Sci., Vol. 8 (part 3), pp. 79-134. Special paper No. 20, 1928.

PALMER, E. J. Botanical reconnaissance of southern Illinois. Jour. Arn. Arboret, Vol. 2, pp. 129-153, 1921.

PEPOON, H. S. An ecological survey of the driftless area of Illinois and Wisconsin. School Sci. and Math., Vol. 9, pp. 441-446, 522-527, 1909.

SAUER, C. O., CADY, G. H., and COWLES, H. C. Starved Rock State Park and its environs: Geogr. Soc. Chicago, Bull. 6, pp. 1-148, 1918.

SHIMEK, B. Prairie openings in the forest: Iowa Acad. Sci., Vol. 17, pp. 16-19, 1910.

SHIMEK, B. An artificial prairie [in roadway through forest]: Lab. Nat. Hist. Univ. Iowa, Bull. 6 (No. 4), pp. 35-42, 1913.

STOVER, E. L. A mesophytic ravine, Rocky Branch: Eastern Illinois State Teachers' College, Charleston, Teachers' College Bull. No. 110, pp. 1-26, 1930.

THONE, FRANK. Ecological factors in the region of Starved Rock, Illinois: Bot. Gaz., Vol. 74, pp. 345-368, 1922.

VESTAL, A. G. Local inclusions of prairie within forest: Trans. Illinois Acad. Sci., Vol. 11, pp. 122-126, 1919 (a).

VESTAL, A. G. Invasion of forest land by prairie along railroads: Trans. Illinois Acad. Sci., Vol. 11, pp. 126-128, 1919 (b).

VESTAL, A. G. Preliminary account of the forests in Cumberland County, Illinois: Trans. Illinois Acad. Sci., Vol. 12, pp. 234-245, 1920.

VESTAL, A. G. A preliminary vegetation map of Illinois: Trans. Illinois Acad. Sci., Vol. 23, pp. 204-217, 1931.

WADMOND, S. C. Flora of Racine and Kenosha counties, Wisconsin: Trans. Wisconsin Acad. Sci. Arts and Letters, Vol. 16 (part 2), pp. 798-888, 1910.

WATERMAN, W. G. Preliminary report on the bogs of northern Illinois. Trans. Illinois Acad. Sci., Vol. 14, pp. 79-84, 1922.