

Natural Areas in the Beech-maple and Maple-basswood Forest Regions of Nine States

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Abstract

Four hundred and eighty-two natural areas of biological or geological interest are now reported within the Beech—maple and Maple—basswood Regions of the 9 states which include these forest regions.

In Indiana, 8 forested natural areas and 17 tracts of other types were previously unpublished. Of the former, the Womer Tract, Bryan Memorial Preserve and Burgdorf Woods are described briefly.

In 1969-70 the National Park Service commissioned 5 theme-studies at as many ecological laboratories in the eastern and central United States, to obtain data from secondary sources for later use in designating many new National Natural Landmarks. The basis for organizing this overall survey was the forest region map inside the back cover of Braun (1950). Our contribution (3, 7) was a study based largely on correspondence, interviews and published sources, of the two forest regions dominated by sugar maple. The Maple-basswood region is confined to parts of Illinois, Wisconsin and Minnesota, whereas Beech-maple occurs in New York, Pennsylvania, Ohio, Michigan, Illinois, Wisconsin, and Indiana. The literature cited consists of 204 titles.

The concept of natural areas and the rationale and techniques of their description and preservation were presented in references 2, 4, 5, 6, 7, 8 and 9. W. B. Barnes has written popular descriptions in "Outdoor Indiana" magazine of most of the 17 areas in the state system of nature preserves, of which he is the Director.

We acknowledge with thanks the information about "new" Indiana stands received from William B. Barnes, Mrs. Thomas E. Dustin and Floyd Swink. Among the multitude who helped provide data for other states condensed into Table 1 we are especially indebted to Drs. Grant Cottam, J. Arthur Herrick, Kenneth S. Erdman and William Tans.

Summary for the Two Entire Regions

A table of data giving only one line for each of 482 tracts of land was prepared, but proved too voluminous for publication. A more generalized summary, given in Table 1, categorizes areas by the single natural feature of special interest, usually the one constituting the chief reason for considering the site worth preserving. Those of the 9 states for which Table 1 shows few tracts are not deficient in natural areas if the whole

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state were considered, but, rather, are states having little acreage of the two of Braun's vegetational Regions that we studied for this project. The larger tracts are often state parks, wildlife areas or metropolitan parks, that possess a great diversity of natural interest in addition to recreational facilities. These are listed as "large, varied" areas. Since our bias as ecologists is toward communities, there is much more of geological interest encompassed in the sites than is reflected by the table. (Practically all the Beech-maple stands occupy land that has been glaciated, for example). The line for "Other geology" includes mostly waterfalls. The tracts considered under "Gorges, bluffs" very often contain relict hemlock colonies. Caves and archaeological sites were omitted. Even though several or many natural features were present, a site is listed only once; therefore, the numbers and totals are significant.

TABLE 1. *Number of natural areas, classed by their chief feature and by state, in only the portions of the state inside the Beech-maple and Maple-basswood Regions of Braun (1). Indiana data are based on Lindsey, Schmelz and Nichols (6) and the present study.*

Types	Ind.	Ia.	Ill.	Wis.	Minn.	Mich.	Ohio	Pa.	N.Y.
Beech-maple	23	—	—	13	—	6	12	2	1
Oak-hickory	16	—	3	5	—	4	11	—	—
Mixed Woods	14	—	10	19	2	3	21	—	1
Maple-basswood	—	—	1	15	4	—	—	—	—
Hemlock-hardwoods	—	1	—	10	—	—	9	1	2
Oak savanna	1	—	—	2	1	—	3	—	—
Flood Plain	2	1	2	4	1	4	3	—	—
Swamp Forest	5	—	1	4	—	4	13	2	2
Bog or Fen	6	—	6	9	1	3	14	10	3
Marsh	—	—	—	2	—	1	3	—	1
Varied Wetlands	—	—	1	1	—	3	9	—	1
Lake, pond	4	—	—	1	1	2	12	1	—
Sand dunes	1	—	2	3	—	1	2	—	—
Prairie	10	—	6	9	3	4	—	—	—
Glacial geology	—	—	—	1	—	—	3	—	2
Gorge; bluff	5	1	1	7	—	—	13	2	—
Other geology	3	—	—	1	—	—	4	—	—
Large, varied	2	—	1	3	2	3	9	2	1
Wildlife refuge	—	—	1	1	—	1	4	—	4
Heronry	1	—	—	—	1	—	2	—	1
TOTALS	93	3	35	110	16	39	147	20	19

Nearly all the good natural areas and nature preserves in Indiana had been described in Lindsey, Schmelz and Nichols (6). Additional Indiana tracts reported to the NPS by the present authors are also included in Table 1.

Indiana Areas Previously Unpublished

Further details on "new" Indiana natural areas are given in Table 2 for forests and Table 3 for tracts where the principal feature is not the tree community, if any.

The largest and most diversified of the new Indiana nature preserves is that donated to the State System of Nature Preserves in 1970 by Mr. and Mrs. John Womer of Chicago. It is 4 miles south of Chesterton and 1 mile east of Rt. 49 on Rd. 750 N. It is in two parts lying a quarter-mile apart on rough land of the Valparaiso moraine. The upland supports a disturbed oak woods, and, in much of the north 80, early lumbering left open conditions now showing early successional stages with scattered small trees and shrubs. About one-third of shallow Carlson Pond lies within the southern 80. There are also 2 small kettle ponds, and a former pond nearly as large as Carlson Pond is now a large depression supporting buttonbush and willows. In the southern part of the south 40, about 10 acres of a mixed forest appear to be essentially undisturbed except for an old woods road.

The Eunice Hamilton Bryan Memorial Nature Preserve is also within the state system under Director William B. Barnes. It was bequeathed by the late Henry R. Smith of Rossville, and named in honor of the mother of Mrs. Smith. The tract was previously known as Smith Woods. The area is notable for many large old trees and includes several permanent ponds which, in April, occupy about 6 of the 29 acres. The soils are Crosby and Brookston. Table 4 gives data on vegetational attributes of the oak-hickory stand on high ground away from the pond edges, and indicates that the major dominant, white oak, had more than double the importance value of shagbark hickory. Irrespective of species, the average acre of the 4 acres (contained within the 0.2 acre sampling strips) showed 101 individual trees over 4 inches diameter at breast height. These trees on the average acre had 117 feet basal area, which is high for Indiana forests. In the 4 acres within the sampling strips, species that had one or more individuals in the 30-inch or larger size class were white oak, red oak, swamp white oak, beech and bur oak. There were 29 such trees sampled, including 18 white oaks, ranging up to the 46-inch size class which had two individuals. The largest red oak was 38 inches and the only swamp white oak measured 42 inches.

Burgdorf Woods, in the extreme southwest corner of Vanderburgh County, has only 10 acres of large, old-growth timber, which is surrounded by woods of lesser quality. It represents the Oak-hickory type, with stratum ranks as follows for trees exceeding 4 inches dbh—red oak (including Shumard's) 7, black oak 6, tulip tree 6, white oak 5 and white ash 5. The species with some stems exceeding 30 inches dbh were Shumard's red oak with 13 such stems, black oak had 10, tulip tree 7, white oak 5, white ash 3, and sugar maple, sycamore and bitternut hickory with one each. In all reproduction strata, sugar maple dominated substantially. Twenty-three species had stems exceeding 22 inches dbh. Of the 142 larger trees measured in the 10 acres, 95 exceeded 22 inches.

TABLE 2. *Forested natural areas in Indiana, previously unpublished. BM indicates Beech-maple type, OH-hickory, and FP is flood plain stand type.*

	Type	Acres	Quadrangle	Twp. & Range	Section	Owner
Burgdorf Wds. (Vanderburgh Co.)	OH	10	W. Franklin	7S, 12W	18, NW	Mrs. P. T. Burgdorf
Bryan Memorial (Clinton Co.)	OH	29	Frankfort	25N, 2W	13, NE ¼ of NE ¼	Div. Nature Pres.
Cameron Wds. (Steuben Co.)	BM	26	Metz	36N, 15E	8 NW ¼ NW ¼	W. Berlett
Klingler Wds. (Allen Co.)	FP	29	Garrett	32N, 12E	3 SW ¼ NW ¼	R. H. Klingler
Miller Tract (Allen Co.)	BM	80	Cedarville	32N, 12E	11 NW ¼	Alpha Miller
Scout Ridge (Monroe Co.)	BM	16	Hindustan	10N, 1E	3 W ½ Ctr.	Nature Pres.
Seaburg Wds. (Noble Co.)	OH	17	Albion	36N, 9E	27 NW ¼	H. Madison
Womer Tract (Porter Co.)	OH	160	Chesterton	36N, 5W	29 & 32	Div. Nature Pres.

TABLE 3. *Non-forest natural areas in Indiana previously unpublished.*

	Acres	Quadrangle	Twp. & Range	Section	Owner
Arethusa Bog	75	Angola W.	38N, 13E	19 SE & SW ¼	Eugene Cope
Binkley E. Bog	70	"	"	30 NE & NW ¼	Mr. Binkley
Hickman Lk. Bog	—	Ege	33N, 10E	31, 36, 38	A. M. Geiger
Koester Bog	25	Ormas	34N, 9E	28, E ½	Marie Koester
Mill Creek Fen	—	Stillwell	37N, 2W	33, SESE	—
Greenwood Pond	25	Auburn & Cedarville	32N, 13E	34, SWSW	H. E. Greenwood
No name Pond	—	New Carlisle	38N, 1W	7 NW ¼, N ½	—
Garretson Heronry	30	Largo	27N, 9W	30	L. A. Garretson
Beaver Lk. Prairie	640	Enos	30N, 9W	4 or 5	Div. Nature Pres.
Haskell Prairie	—	Wanatah	31N, 9W	2, 35	—
Lake Co. Prairies ¹	—	—	35N, 4W	8 SWSE	Monon R.R.
Lake Pleasant Marl Prairie	95	Angola W.	38N, 12-13E	17 NENW, NWNE	Various
Monon R.R. Prairie	—	Monticello N.	Linear	13, 14, 18	Ben Collins
Shallow Lk. Prairie	140	Orland	37N, R 12 E	7	P. R. & State
Trail Creek Site	—	Mich. City E	38N, 4W	35, SW ¼	Mr. Rude
Devil's Hollow	60	Arcola	30N, 11E	18, SE ¼	Mich. Twp.
Shanty Falls	40	Wabash	27N, 6E	20, SW ¼	R. L. & M. L. Mellen
				Reserve 55	Don Stouffer

¹Includes mostly small remnant areas of prairie close in to industry and railroads, such as Cook Prairie (St. John village), Miller Dune tract, Pepono Prairie (Gary, W.), and Tolleston Area (Hammond). Specific Locations in (3) and (7).

TABLE 4. *Vegetational Attributes¹ in the high ground, old growth stand at Bryan Woods, Clinton County, Indiana.*

Species	D ₂	D ₃	B ₂	B ₃	F ₃	V ₃
White oak	13.5	13.3	51.5	44.1	13.6	23.6
Shagbark hickory	13.2	13.0	8.8	7.5	14.1	11.5
White ash	14.5	14.2	7.8	6.6	13.2	11.3
Ironwood	14.0	13.7	2.1	1.8	12.5	9.4
Basswood	12.2	12.0	2.6	2.2	8.5	7.6
Beech	4.5	4.4	7.5	6.4	4.7	5.2
Sugar maple	5.2	5.1	4.3	3.7	5.5	4.8
Red oak	4.2	4.1	16.9	14.5	5.5	4.7
American elm	5.2	5.1	.8	.74	5.9	3.9
Pignut hickory	4.0	3.9	2.6	2.2	4.0	3.4
Bur oak	1.2	1.2	3.3	2.8	1.31	1.80
Wild cherry	2.0	1.97	.25	.21	2.22	1.47
Walnut	1.5	1.48	1.34	1.15	1.56	1.40
Swamp white oak	.2	.25	2.5	2.17	.30	.91
Blue beech	1.0	.98	.13	.11	1.31	.82
Silver maple	1.0	.98	.96	.82	.65	.80
Sycamore	.50	.49	1.00	.86	.65	.67
Red maple	.75	.74	.42	.36	.91	.67
Bitternut hickory	.50	.49	.79	.68	.65	.61
Hackberry	.50	.49	.10	.08	.65	.41
Flowering dogwood	.50	.49	.05	.04	.65	.39
Sassafras	.25	.25	.27	.23	.30	.26
Tulip tree	.25	.25	.08	.07	.30	.21
Pin oak	.25	.25	.05	.04	.30	.20
Red elm	.25	.25	.04	.03	.30	.19
TOTALS	D _p =101		B _p =117			

¹Based on trees 4 inches or more dbh. Twenty sampling strips (each 400 feet long and one-fifth acre area) were laid out, totalling 4 acres in area. D₂ symbolizes density per mean acre, D₃ is relative density, B₂ is basal area per acre, B₃ relative basal area, F₃ is relative frequency and V₃ importance value.

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