 0030-0950/82/0005-0252 $2.00/0

SURVEY OF THE VEGETATION AND FLORA OF A WETLAND IN KISER LAKE STATE PARK, CHAMPAIGN COUNTY, OHIO[1]

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ABSTRACT. We classified plant communities by criteria of physiognomy, environment, and flora. Use of Mueller-Dombois and Ellenberg's classification scheme for the world's vegetation provided 6 vegetation categories. The results of a Bray-Curtis ordination were consistent with our field observation of a correlation between these vegetation categories and a soil moisture gradient. The results of a cluster analysis were consistent with 5 of the vegetation categories, but the sixth should be subdivided according to variations in floristic composition. Our proposed classification has 8 plant communities: an alluvial forest dominated by *Acer negundo* and *Parthenocissus quinquefolia,* a reed swamp dominated by *Eupatorium perfoliatum* and *Typha latifolia,* a deciduous thicket dominated by *Crataegus punctata,* a second deciduous thicket dominated by *Cornus obliqua* and *Aster pilosus,* and a third deciduous thicket dominated by *Rosa palustris* and *R. setigera,* a perennial forb community dominated by *Clematis virginiana* and *Verbesina alternifolia,* a tall-sedge swamp dominated by *Carex stricta* and *Eupatorium maculatum,* and a herbaceous floating meadow dominated by *Typha latifolia* and *Eupatorium perfoliatum.* We list 183 species (of 61 families) and state the communities in which each is common.

OHIO J. SCI. 82(5): 252, 1982

INTRODUCTION

The plant communities of wetland areas in Ohio and nearby portions of adjacent states have been studied primarily to determine patterns of vegetation change following Pleistocene glaciation. Investigations of the often highly diverse plant communities of contemporary wetlands of this region are small in number and include Dachnowski (1910, 1912), Gordon (1933), Cain and Slater (1948), Foos (1971), Mossman (1972), McGill (1973), and Frederick (1974). The community classifications produced in these studies were based on general field observations and were not supplemented with vegetation analysis techniques such as ordination or cluster analysis. Also, most studies developed classification schemes that are so site specific that comparison of different wetlands is difficult.

Our objectives were to survey the vegetation and flora of a wetland of this region, and to illustrate an approach to the classification of wetland plant communities that can expedite comparison of various wetlands when studied in the future.

The area studied is a portion of Kiser Lake State Park, which is located in Champaign County, Ohio, and is about 5 km north of St. Paris, Ohio. The park is at approximately 40°11′ North latitude and 83°57′ West longitude and is mapped on the St. Paris Quadrangle of the USGS 7.5 minute series. The study area is the extreme southeast portion of the park. It is a 16 ha wetland bisected by Mosquito Creek (fig. 1). It is situated on the Farmersville Moraine, a deposit of Wisconsin glaciation. The northeast and extreme southern portions of the study area are on deposits eroded from kames and therefore are slightly raised in elevation. The rest of the area is situated on more recent alluvial deposits (Quinn 1972). The soils of the study

[1]Manuscript received 2 March 1981 and in revised form 17 December 1981 (#81–10).

area are generally rich in organic matter; however, other characteristics, especially those involving soil moisture, are variable.

From about 1810 to 1880, the area now within the park consisted of a 120 ha "peatland" surrounding a man-made lake (Ogden 1881, Dachnowski 1912). After 1880, the lake gradually drained as the dam fell into disrepair. Middleton wrote in 1917 that the dredging of Mosquito Creek was being proposed and that 1000 ha would be affected. Today, meter high banks occur on either side of the creek, about 3 meters from its edge. These may indicate dredging; however, little straightening of the creek is apparent.

The wetland was tiled in a drainage project completed in 1918 (B. Howard, pers. comm.). The effects of this project are no longer apparent. Presumably, if farmland had been created in 1918, it was abandoned by 1933 when John Kiser, Jr. donated the land to the state. Construction of the present dam began in 1934, and the park was established in 1939. In 1975, the study area was set aside as an Interpretive Preserve by the Ohio Department of Natural Resources.

METHODS AND MATERIALS

Initially we categorized the vegetation of the study area through correlation of our field observations with Mueller-Dombois and Ellenberg's (1974) physiognomic-ecologic classification scheme of the world's vegetation. We collected quantitative data from 3 m^2 circular sample plots. These plots were placed 20 m apart along each of several parallel east-west lines which were positioned 40 m apart through the study area. A random numbers table was used to determine the position of the initial plot 0–10 m from the beginning of each line. In each of the 103 plots, we identified all vascular plants (including those overhanging the plots) and, during July and August 1977, estimated their percent cover using 5 classes: 0–20%, 21–40%, 41–60%, 61–80%, 81–100%. Voucher specimens of all species were deposited in the Willard Sherman Turrell Herbarium of Miami University (MU).

We used species presence-absence data from the study plots in ordination and cluster analyses. The ordination was the type proposed by Bray and Curtis (1957; see Cox 1976 for the approximate procedure). The cluster analysis was a Statistical Analysis Systems (SAS) package (Barr et al. 1976). It produced a classification of study plots (based on floristic composition), that we compared to the initial vegetation categories (based on physiognomy and environment) to produce a classification of the plant communities. Dominant species are defined on the basis of estimated cover values.

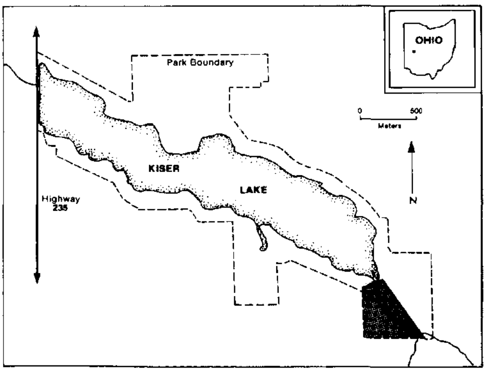

FIGURE 1. Map of Kiser Lake State Park. The study area, illustrated by shading, is bisected by Mosquito Creek.

RESULTS

Through general field observations, we recognized several vegetation types based on criteria of physiognomy and environment (terminology closely approximates that of Mueller-Dombois and Ellenberg 1974). A band of alluvial forest occurs along the creek bank and divides the area into 2 sections. East of the creek there are 4 vegetation types. At the northeast end of the preserve is a reed swamp. Just south of this area there is a deciduous thicket at a somewhat higher elevation. Further to the southeast is a perennial forb type, and at the southeast end is a tall-sedge swamp. West of Mosquito Creek there are 2 major vegetation types: a deciduous thicket at the northwest end and a herbaceous floating meadow to the south.

The 103 sample plots were divided into the 6 categories outlined above and these were graphed on the ordination (fig. 2). Field observations had indicated that plots with greatest soil moisture were those of the herbaceous floating meadow and reed swamp. Somewhat less soil moisture had been observed in some stands of the deciduous thicket, the perennial forb type, and

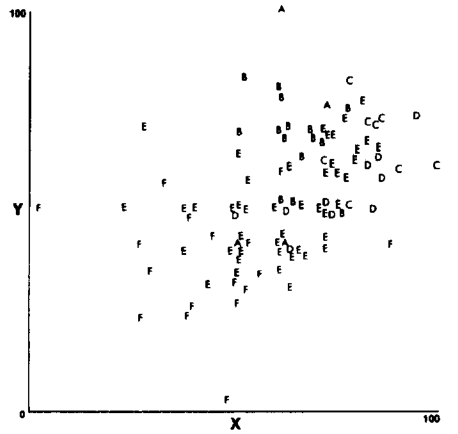

FIGURE 2. Bray-Curtis ordination (X and Y axes with a 0–100 scale). Sample plots are labeled as follows: (A) herbaceous floating mat, (B) reed swamp, (C) deciduous thicket, (D) perennial forb, (E) tall-sedge swamp, and (F) alluvial forest.

the tall-sedge swamp. Still lower amounts of soil moisture had been apparent in the alluvial forest (and some other stands of deciduous thicket). In the ordination figure, plots from drier areas are concentrated primarily in the lower left quadrant and plots from wetter sites predominate toward the upper right quadrant. Therefore, the general array of plots is consistent with our field observations, however, there is considerable overlap of the ordination space of the 6 groups.

This overlap suggested that the original physiognomic-ecologic classification could be improved by incorporating information on floristic composition. Neff (1978) found cluster analysis was best suited for this task (her dendrogram is not reproduced here because of its excessive size and complexity). Sample plots of 5 of the 6 categories of the initial classification occupied relatively distinct portions of the cluster analysis dendrogram. In contrast, plots from the deciduous thicket occurred in several scattered groups and could be subdivided by dominant species into *Crataegus, Cornus,* and *Rosa* dominated communities (nomenclature follows Gleason and Cronquist 1963). Samples from the first 2 of these categories were grouped in different, relatively distinct portions of the dendrogram. The sample plots of the *Rosa*-dominated deciduous thicket were scattered across the dendrogram, indicating substantial variation in their herbaceous species.

On the basis of field observations and data analyses, several plant communities may be distinguished and their differences may be considered to be correlated with a soil moisture gradient.

One community is an alluvial forest (represented by 18 plots). It occurs in a strip along Mosquito Creek and has a relatively open canopy characterized by *Acer negundo* (average estimated cover of 18%). The understory is dominated by *Parthenocissus quinquefolia* (11%), *Verbesina alternifolia* (10%), *Galium aparine* (9%), *Viola papilionaceae* (9%), and *Viola striata* (6%).

A second community is a reed swamp (4 plots). It has such characteristic species as *Eleocharis erythropoda* (9%), *Eupatorium perfoliatum* (9%), *Sagittaria latifolia* (9%), *Typha latifolia* (9%), and *Scirpus atrovirens* (4%).

Three other communities belong to the deciduous thicket category. The *Crataegus* deciduous thicket community (16 plots) is dominated by *C. punctata* (44%); also present are *C. calpodendron* (9%) and *C. monogyna* (5%). Understory species include *Verbesina alternifolia* (18%), *Galium aparine* (14%), and *Alliaria officinalis* (10%). The presence of *V. alternifolia* and *G. aparine* on the list of dominants for both the alluvial forest and *Crataegus* deciduous thicket communities reflects a strong similarity between the understories of the 2 communities. The *Cornus* deciduous thicket community (24 plots) is characterized by *C. obliqua* (12%), *C. stolonifera* (9%), and *Salix discolor* (5%) as overstory species. Characteristic understory species include *Aster pilosus* (20%), *Leersia oryzoides* (13%), *Aster novae-angliae* (7%), and *Solidago patula* (5%). The *Rosa* deciduous thicket community (6 plots) contains the dominants *R. palustris* (44%) and *R. set-*

igera (12%) in dense stands. Its understory is variable.

The sixth community is the perennial forb (10 plots). It is characterized by *Clematis virginiana* (18%), *Verbesina alternifolia* (14%), *Eupatorium maculatum* (12%), *Solidago patula* (4%), and scattered individuals of *Sambucus canadensis* (8%).

The seventh community is the tall-sedge swamp (10 plots). It is characterized by *Carex stricta* (42%), *Eupatorium maculatum* (18%), *Filipendula rubra* (10%), and *Pycnanthemum virginianum* (4%).

The eighth community is the herbaceous floating meadow (15 plots), which is composed of a dense mat of herbaceous species and mosses. Characteristic species include *Typha latifolia* (14%), *Eupatorium perfoliatum* (13%), *Sagittaria latifolia* (13%), *Equisetum arvense* (12%), *Carex trichocarpa* (7%), and *Scirpus validus* (7%). Scattered clumps of *Salix discolor* (8%) and *Salix sericea* (5%) also occur in this community.

Table 1 contains a list of taxa encountered in this study and denotes the communities in which they are common.

DISCUSSION

Comparison of the communities described in this study with those of other studies of wetlands in the region indicates some similarities. Dachnowski (1912) surveyed the peatlands of Ohio, examining them from botanical-ecological and economic resource perspectives. His classification of the plant associations was based on habitat, dominant taxa, and presumed successional relationships. Three of the 10 associations belonging to his bog sere resemble communities described for the Kiser Lake wetland: his *Carex-Juncus* association (as well as his shoreline *Carex-Juncus-Scirpus* association) is similar to our herbaceous floating meadow community, his *Salix* sp.-*Populus tremuloides* association (when the latter species is absent) resembles in physiognomy our deciduous thickets, and his *Cephalanthus occidentalis-Cornus* sp. association is similar to our *Cornus*-dominated deciduous thicket community. In addition, his *Acer-Fraxinus-Ulmus* mesophytic deciduous forest association resembles our alluvial forest.

Gordon (1933) described a raised bog in west-central Ohio, listing only the more common species. Some of his taxa also occur at the Kiser Lake wetland, e. g. *Potentilla fruticosa, Carex* spp., *Angelica atropurpurea, Rosa palustris, Sambucus canadensis,* and *Agrimonia parviflora.*

Cain and Slater (1948) described several communities around Sodon Lake in southeast Michigan. Their herbaceous fen community is apparently similar in physiognomy to the Kiser Lake herbaceous floating meadow. Species of this Kiser Lake community that are also important at Sodon Lake include *Salix discolor* and *Scirpus validus* (frequency values at the Sodon Lake fen of 20% and 70% respectively). The Sodon Lake shrubby fen includes 3 of the characteristic species of the Kiser Lake *Cornus*-dominated deciduous thicket: *Salix discolor* (frequency of 13.2%), *Aster novae-angliae* (13.2%), and *Cornus stolonifera* (6.6%). Nevertheless, this does not represent significant floristic similarity since the shrubby fen (deciduous thicket) at Sodon Lake has a northern affinity, as evidenced by the authors' use of *Betula pumila* as its characteristic species.

Mossman (1972) described 10 vegetation zones at Camden (Bog) Lake, in northeast Ohio. A few of these apparently are similar in physiognomy to communities present at Kiser Lake: the *Decodon-Dryopteris* zone (a herbaceous floating meadow); the *Ilex-Viburnum, Sparganium-Ludwigia,* and *Phalaris* zones (all similar in physiognomy to deciduous thicket); and the *Populus-Salix* and *Prunus-Acer* zones (similar to the alluvial forest).

McGill (1973) studied the flora of 2 small lakes located approximately 12 km from the Kiser Lake wetland. He described 12 vegetation zones in and around the larger lake and 5 for the smaller lake. Of his 3 forest zones, the Ash-Maple is most similar to our alluvial forest; *Viola striata* is

TABLE 1

Taxa found in the Kiser Lake wetland. Abbreviations indicate the communities in which the species is common. [1]

ACERACEAE	
Acer Negundo L.	AF
Acer saccharum Marsh.	AF
ALISMATACEAE	
Alisma Plantago-aquatica L.	RS
Sagittaria latifolia Willd.	RS, FM
ANACARDIACEAE	
Rhus radicans L.	AF
Rhus Vernix L.	FM
Rhus typhina L.	AF
APOCYNACEAE	
Apocynum cannabinum L.	DT_1
ARACEAE	
Arisaema Dracontium (L.) Schott	AF
Symplocarpus foetidus (L.) Nutt.	DT_1, RS, AF
ARISTOLOCHIACEAE	
Asarum canadense L.	AF
ASCLEPIADACEAE	
Asclepias incarnata L.	FM
BALSAMINACEAE	
Impatiens biflora Walt.	AF, DT_1, DT_2
Impatiens pallida Nutt.	AF
CAESALPINIACEAE	
Cercis canadensis L.	AF
CAMPANULACEAE	
Campanula americana L.	AF
CAPRIFOLIACEAE	
Sambucus canadensis L.	AF, PF, DT_1
Viburnum prunifolium L.	TS, FM
CELASTRACEAE	
Euonymus obovatus Nutt.	AF, DT_3
CERATOPHYLLACEAE	
Ceratophyllum demersum L.	RS
COMMELINACEAE	
Tradescantia subaspera Ker.	DT_1
COMPOSITAE	
Ambrosia trifida L.	AF
Arctium minus Schk.	AF
Aster cordifolius L.	AF
Aster novae-angliae L.	DT_1, DT_2
Aster pilosus Willd.	DT_1, DT_2
Aster prenanthoides Muhl.	AF
Aster puniceus L.	DT_1, DT_2
Aster simplex Willd.	DT_1, DT_2
Bidens cernua L.	FM, RS
Bidens frondosa L.	FM, RS
Cirsium muticum Michx.	DT_1
Eupatorium maculatum L.	RS, FM, PF, TS
Eupatorium perfoliatum L.	RS, FM, PF, TS
Eupatorium rugosum Houtt.	AF
Helianthus divaricatus L.	AF
Helianthus giganteus L.	FM
Lactuca canadensis L.	AF
Rudbeckia laciniata L.	AF
Senecio aureus L.	AF, DT_3
Silphium integrifolium Michx.	PF, DT_3
Silphium trifoliatum L.	PF, DT_3
Solidago canadensis L.	Widespread
Solidago patula Muhl.	DT_1, PF
Verbesina alternifolia (L.) Britt.	AF, PF, DT_1, DT_3
Vernonia altissima Nutt.	PF, DT_1
CONVOLVULACEAE	
Convolvulus sepium L.	Widespread
Cuscuta Gronovii Willd.	DT_1, PF
CORNACEAE	
Cornus alternifolia L. f.	DT_1, AF
Cornus obliqua	DT_1
Cornus stolonifera Michx.	DT_1
CRASSULACEAE	
Penthorum sedoides L.	DT_1
CRUCIFERAE	
Alliaria officinalis Andrz.	AF, DT_3
Nasturtium officinale R. Br.	RS
CYPERACEAE	
Carex cristatella Britt.	FM
Carex granularis Muhl.	FM, RS
Carex lacustris Willd.	RS
Carex lurida Wahl.	FM
Carex stricta Lam.	TS
Carex trichocarpa Muhl.	FM
Carex vulpinoidea Michx.	FM, RS
Eleocharis erythropoda Steud.	RS
Scirpus americanus Pers.	RS
Scirpus atrovirens Willd.	RS
Scirpus validus Vahl.	FM
DIPSACACEAE	
Dipsacus sylvestris Huds.	AF
EQUISETACEAE	
Equisetum arvense L.	FM
Equisetum pratense Ehrh.	DT_3
FABACEAE	
Amphicarpa bracteata (L.) Fern.	Widespread
Apios americana Medic.	DT_1, DT_2
GRAMINEAE	
Agrostis stolonifera var. *major* (Graud.) Farw.	DT_1
Bromus latiglumis (Shear) Hitchc.	DT_1
Cinna arundinaceae L.	DT_1
Elymus virginicus L.	AF
Glyceria striata (Lam.) Hitchc.	DT_1
Leersia oryzoides (L.) Sw.	DT_1, DT_2, RS, FM
Phalaris arundinaceae L.	AF, DT_1
Sorghastrum nutans (L.) Nash.	DT_1
HIPPOCASTANACEAE	
Aesculus glabra Willd.	AF

TABLE 1 *Continued*

HYDROCHARITACEAE
Anacharis canadensis (Michx.) Rich. RS

JUGLANDACEAE
Juglans nigra L. AF

JUNCACEAE
Juncus brachycephalus (Engelm.) Buch. RS
Juncus Dudleyi Wieg. AF

LABIATAE
Agastache nepetoides (L.) Kuntze. AF
Glecoma hederacea L. AF, DT$_3$
Lycopus americanus Muhl. FM, RS
Mentha aquatica L. RS
Mentha piperita L. AF
Monarda fistulosa L. PF
Prunella vulgaris L. AF
Pycnanthemum virginianum (L.) Durand & Jackson. TS
Scutellaria lateriflora L. AF
Stachys tenuifolia Willd. AF, DT$_3$
Teucrium canadense L. AF

LAURACEAE
Lindera Benzoin (L.) Blume DT$_3$

LEMNACEAE
Lemna minor L. RS

LILIACEAE
Allium tricoccum Ait. AF
Polygonatum biflorum (Walt.) Ell. AF
Smilacina racemosa (L.) Desf. AF
Smilax glauca Walt. AF
Trillium sp. L. AF

LOBELIACEAE
Lobelia siphilitica L. AF

MENISPERMACEAE
Menispermum canadense L. AF

NAJADACEAE
Potamogeton crispus L. RS

OLEACEAE
Fraxinus americana L. AF

ONAGRACEAE
Circaea quadrisulcata (Maxim.) Franch. & Sav. AF
Epilobium glandulosum Lehm. FM
Epilobium palustre L. FM
Oenothera biennis L. TS

OPHIOGLOSSACEAE
Botrychium virginianum (L.) Sw. AF

OXALIDACEAE
Oxalis stricta L. AF

PHRYMACEAE
Phryma Leptostachya L. AF, DT$_3$

PLATANACEAE
Platanus occidentalis L. AF

POLEMONIACEAE
Phlox maculata L. DT$_2$

POLYGONACEAE
Polygonum Hydropiper L. DT$_1$
Polygonum Persicaria L. DT$_1$
Polygonum sagittatum L. DT$_1$
Polygonum scandens L. PF
Polygonum virginianum L. DT$_1$, AF

POLYPODIACEAE
Thelypteris palustris Schott. TS

PRIMULACEAE
Lysimachia ciliata L. DT
Lysimachia Nummularia L. AF, DT$_1$

RANUNCULACEAE
Anemone virginiana L. AF, DT$_3$
Aquilegia canadensis L. AF
Caltha palustris L. RS, FM
Clematis virginiana L. PF, TS
Thalictrum polygamum Muhl. DT$_1$, AF

RHAMNACEAE
Rhamnus lanceolatus Pursh. DT$_1$, TS

ROSACEAE
Agrimonia parviflora Ait. DT$_1$
Agrimonia pubescens Wallr. DT$_3$
Crataegus Calpodendron (Ehrh.) Medic. DT$_3$
Crataegus monogyna Jacq. DT$_3$
Crataegus punctata Jacq. DT$_3$
Duchesnea indica (Andr.) Focke DT$_3$
Filipendula rubra (Hill.) Robins TS
Fragaria virginiana Duchesne. DT$_3$
Geum canadense Jacq. AF, DT$_3$
Physocarpus opulifolius (L.) Maxim. DT$_1$, TS
Potentilla fruticosa L. PF, TS
Potentilla simplex Michx. AF, DT$_3$
Prunus pensylvanica L. f. DT$_1$
Prunus serotina Ehrh. AF
Pyrus sp. L. DT$_3$
Rosa palustris Marsh. DT$_2$
Rosa setigera Michx. DT$_2$
Rubus spp. L. DT$_1$, PF

RUBIACEAE
Galium Aparine L. AF, DT$_3$
Galium asprellum Michx. FM, DT$_1$, PF
Galium circaezans Michx. DT$_3$
Galium Mollugo L. DT$_3$
Galium trifidum L. FM

RUTACEAE
Zanthoxylum americanum Mill. DT$_3$

SALICACEAE
Populus deltoides Marsh. AF
Salix discolor Muhl. DT$_1$, FM
Salix nigra L. DT$_1$
Salix sericea Marsh. DT$_2$, FM

TABLE 1 *Continued*

SAXIFRAGACEAE	
Ribes hirtellum Michx.	AF, RS
SCROPHULARIACEAE	
Chelone glabra L.	PF
Mimulus ringens L.	AF
Pedicularis lanceolata Michx.	FM
Scrophularia lanceolata Pursh.	AF
Veronica Anagallis-aquatica L.	In Mosquito Creek
SPARGANIACEAE	
Sparganium eurycarpum Englem.	RS, FM
TYPHACEAE	
Typha latifolia L.	RS, FM
ULMACEAE	
Celtis occidentalis L.	AF
Ulmus rubra Muhl.	AF
UMBELLIFERAE	
Aethusa Cynapium L.	AF
Angelica atropurpurea L.	DT_1
Cicuta bulbifera L.	FM
Cryptotaenia canadensis (L.) DC.	AF
Daucus Carota L.	AF
Oxypolis rigidior (L.) Raf.	AF
Sanicula marilandica L.	AF
URTICACEAE	
Pilea pumila (L.) Gray	Widespread
Urtica dioica L.	AF
VERBENACEAE	
Verbena hastata L.	TS
Verbena urticifolia L.	AF
VIOLACEAE	
Viola eriocarpa Schw.	AF
Viola palmata L.	DT_3
Viola papilionacea Pursh.	AF
Viola striata Ait.	AF
VITACEAE	
Parthenocissus quinquefolia (L.) Planch.	AF
Vitis riparia Michx.	AF

[1]AF – alluvial forest
RS – reed swamp
DT_1 – *Cornus*-dominated deciduous thicket
DT_2 – *Rosa*-dominated deciduous thicket
DT_3 – *Crataegus*-dominated deciduous thicket
TS – tall-sedge swamp
PF – perennial forb
FM – herbaceous floating meadow

a common species in both areas. His 4 shrub-dominated zones are similar in physiognomy to our deciduous thickets, but there is little similarity in dominant taxa. His swamp-reed vegetation zone is similar to our reed-swamp community. His *Decodon* zone resembles our herbaceous floating meadow community; *Typha latifolia* and *Eupatorium perfoliatum* are common in both areas. Overall, 50% of the Kiser Lake wetland taxa were reported at either or both of the lake sites.

Frederick (1974) described 6 vegetation types for Cedar Bog, located approximately 25 km from the Kiser Lake wetland. The bog meadow, swamp forest, and shrub community at Cedar Bog are floristically related to some communities found at Kiser Lake. The bog meadow of Cedar Bog has several species in common with Kiser Lake's tall-sedge swamp, both the *Cornus* and *Rosa* deciduous thickets, the herbaceous floating meadow, and the perennial forb communities. For example, *Potentilla fruticosa, Filipendula rubra,* and the *Eupatorium, Solidago,* and *Aster* genera were reported from the bog meadow of Cedar Bog and also occur in the perennial forb and tall-sedge swamp communities of the Kiser Lake wetland. Likewise, she listed *Cornus alternifolia* and the *Rubus, Solidago,* and *Eupatorium* genera as found in the drier portions of the bog meadow of Cedar Bog; they are also found in the *Cornus*-dominated deciduous thicket at Kiser Lake. The swamp forest of Cedar Bog and the alluvial forest in the Kiser Lake wetland differ with respect to tree species present; *Tilia americana, Liriodendron tulipifera, Quercus bicolor,* and *Acer rubrum* were described as common at Cedar Bog, whereas *Acer negundo* and *Populus deltoides* are characteristic at Kiser Lake. However, both forest communities contain similar understory species, including *Alliaria officinalis, Thalictrum polygamum, Eupatorium rugosum, Rudbeckia laciniata,* and *Senecio aureus.* Lastly, the shrub community at Cedar Bog contains species similar to those in the *Cornus*- and *Rosa*- dominated deciduous thicket communities at Kiser Lake; taxa in common include *Rosa setigera, R. palustris, Sambucus canadensis,* and the *Cornus, Salix,* and *Rubus* genera. Overall, slightly over 75% of the taxa of the Kiser Lake wetland were reported at Cedar Bog.

In conclusion, it is apparent that there are substantial differences in the flora and vegetation of wetlands within the region considered in this study. Although it is possible to correlate some vegetation categories of different wetland studies, the lack of a systematic approach to the classification of wetland vegetation has made this correlation both difficult and incomplete. Our study represents the first attempt at utilizing data analysis methods to classify the plant communities of a wetland in this region. The Mueller-Dombois and Ellenberg (1974) classification of world vegetation types provided an initial framework for defining the general vegetation categories of the study area. Use of this systematic, universal classification scheme in the future will expedite comparison of different mideast wetlands. The Bray-Curtis ordination permitted an interpretation of the environmental factor (soil moisture) correlated with vegetation differences at the study site. The cluster analysis provided a classification (based on floristic composition) that was compared to the initial physiognomic-ecologic classification and used to elaborate on it.

ACKNOWLEDGMENTS. Drs. Will H. Blackwell, Jr., Miami University, and Ronald L. Stuckey, Ohio State University, were of great assistance in the identification of many species. Mr. Bruce Howard was a valuable source of information about the land use history of the Kiser Lake area. The consultants of the Miami University Academic Computer Service aided in the computer analyses. The Willard Sherman Turrell Herbarium Fund provided financial support (grant #8), and the Kenneth Wigglesworth family furnished living quarters near the study area.

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