

A LIST OF THE GRASSES AND GRASSLIKE PLANTS OF THE OAK OPENINGS, LUCAS COUNTY, OHIO¹

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ABSTRACT

This report is the second of a series of articles to be prepared as a second "Flora of the Oak Openings." The study represents a comprehensive survey of members of the Cyperaceae, Gramineae, Juncaceae, Sparganiaceae, and Xyridaceae in the Oak Openings region.

Of the 202 species listed in this study, 34 species reported by Moseley in 1928 were not found during the present investigation. Fifty-seven species found by the present investigator were not observed or reported by Moseley. Many of these species or varieties are rare and do not represent a stable part of the flora. Changes in species present or in frequency of occurrence of species collected by both Moseley and Easterly may be explained mainly by the alteration of habitats as the Oak Openings region becomes increasingly urbanized or suburbanized. Some species have increased in frequency on the floodplain of Swan Creek, in wet ditches and on the banks of the Norfolk and Western Railroad right-of-way, along newly constructed roadsides, or on dry sandy sites.

INTRODUCTION

The grass family ranks third among the large plant families of the world. The family ranks number one as far as total numbers of plants that cover fields, meadows, or roadsides are concerned. No other family is used as extensively to provide food or shelter or to create a beautiful landscape. The sedge family does not fare as well in terms of commercial importance, but the sedges do make available forage and food for wild fowl and they do contribute plant cover in wet areas where other plants would not be as well adapted.

In the Oak Openings of northwest Ohio, 44 percent of the monocotyledonous species listed by Moseley in his classic publication (1928) were grasses and sedges. Sixteen percent of the grass species listed by Moseley were introduced from Europe. No cultivated cereal grasses were listed, but five species were grown as hay or pasture grasses. At the time of Moseley's work (1928), only between one-fifth and one-fourth of the Oak Openings land was in cultivation. Today, approximately three-fourths of the original Oak Openings has gone to cultivation or to urban or suburban development and the numbers of grass and grasslike species in the flora has become much greater.

The present work represents the second paper in a series of reports to be prepared as a second "Flora of the Oak Openings," of which the first dealt with the composites (Easterly, 1972). The primary objective of this report is to list the members of the Gramineae and of four other "grasslike" families (Cyperaceae, Juncaceae, Sparganiaceae, and Xyridaceae) found in the Oak Openings in recent years (1966-1971) and to note what changes have taken place in this grass-and-sedge flora since the classic work of Moseley (1928).

COLLECTING SITES AND METHODS

For the past several years, a comprehensive floral survey has been in progress in the region outlined as the Oak Openings by Moseley (1928). The major collecting efforts have been concentrated at eight locations, as described in the first paper (Easterly, 1972). The locations (fig. 1) of these eight sites are:

- (1) Oak Openings Metropolitan Park—wet woods, wet or dry sand, and dry fields throughout the 3,260 acres in Swanton Township;
- (2) Maumee State Forest—drainage ditches, moist open sandy woods, and sandy fields throughout this forest region in Swanton Township;

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- (3) Davis Road and Obee Road intersection—wet woods and wet or dry sand in the southwest corner of this intersection (now being developed as private school grounds) in Waterville Township;
- (4) Reed Road and Whitehouse-Spencer Road intersection—wet woods and sand in the southwest corner of this intersection (part of the land used by Lucas County as a garbage-transfer station) in Swanton Township;
- (5) Eber Road and La Plante Road intersection—swampy woods and sand in the northeast corner of this intersection in Monclova Township;
- (6) Wabash (now Norfolk and Western) Railroad transect through the Oak Openings—wet ditches, wet woods, sandy meadows and fields all along this transect from Whitehouse-Spencer Road west to State Route 64;
- (7) Swan Creek floodplain—wet woods and fields along Swan Creek from State Route 295 to Monclova Road in Swanton Township; and
- (8) Irwin Prairie—a wet-prairie habitat at Dorr Street and Irwin Road in Spencer Township.

In addition to these eight locations two other collecting sites have yielded important data. These sites are: Springbrook Picnic area on State Route 64 near Monclova Road and Twin Acres Campground on State Route 64 near State Route 295 (see fig. 1).

Voucher specimens for the present study have been stored in the Herbarium at Bowling Green State University. Duplicates of doubtful specimens were sent to various authorities for verification: to Dr. Clara Weishaupt, The Ohio State University, for Ohio grasses; to Dr. James H. Zimmerman, University of Wisconsin at Madison, for *Carex*; to Dr. Neil Harriman, University of Wisconsin at Oshkosh, for *Juncus*; to Dr. A. E. Schuyler, Academy of Natural Sciences of Philadelphia, for *Scirpus*; to Dr. H. A. Wahl, The Pennsylvania State University, for *Carex*; and to Dr. E. G. Voss, University of Michigan, for *Eleocharis*.

Frequency of occurrence has been recorded throughout the study of the Oak Openings, using Moseley's code (1928). The terms of this code are defined as follows: (1) *rare*, seen in fewer than 5 places; (2) *scarce*, seen in fewer than 15 places; (3) *infrequent*, seen several times during a day's field trip; (4) *frequent*, a few thousand plants per square mile; (5) *common*, many thousands of plants per square mile; (6) *abundant*, hundreds of thousands of plants per square mile; and (7) *local*, many plants in a few places, elsewhere few or none. In places Moseley made no comment after the species citations in his check list; this probably indicated that he hadn't adequately noticed the species, that he may have overlooked it, or that he failed to visit the habitat in the right season (Moseley, 1928, p. 93).

THE ANNOTATED CHECK LIST OF GRASSES AND GRASSLIKE PLANTS IN THE OAK OPENINGS

The following alphabetical list contains the names of all grasses and grasslike plants found in the Oak Openings either by myself or by Edwin L. Moseley (1928). Also included are the distribution of each species in Ohio (Braun, 1967); the habitat, frequency of occurrence, and flowering time as observed by me (cited as NWE); and the frequency of occurrence in 1928, as cited by E. L. Moseley (ELM). Older names from the seventh edition of Gray's Manual of Botany (Robinson and Fernald, 1908), as used by Moseley (1928), are also listed. Revisions of Moseley's (1928) species names are all based on study of voucher specimens. Where specimens available for study are other than those used by Moseley in 1928 or those of the present author, they are cited by name, collector's number, and herbarium (BGSU = Bowling Green State University Herbarium; OS = The Ohio State University Herbarium). The present nomenclature follows that of Braun (1967) in *The Monocotyledoneae* and of other sources for special species, the appropriate reference being cited at these places. Species marked with an asterisk (*) are those that, in Moseley's list of species, were indicated either as being more common in the Oak Openings than in all the rest of Ohio or as being especially abundant in the Oak Openings.

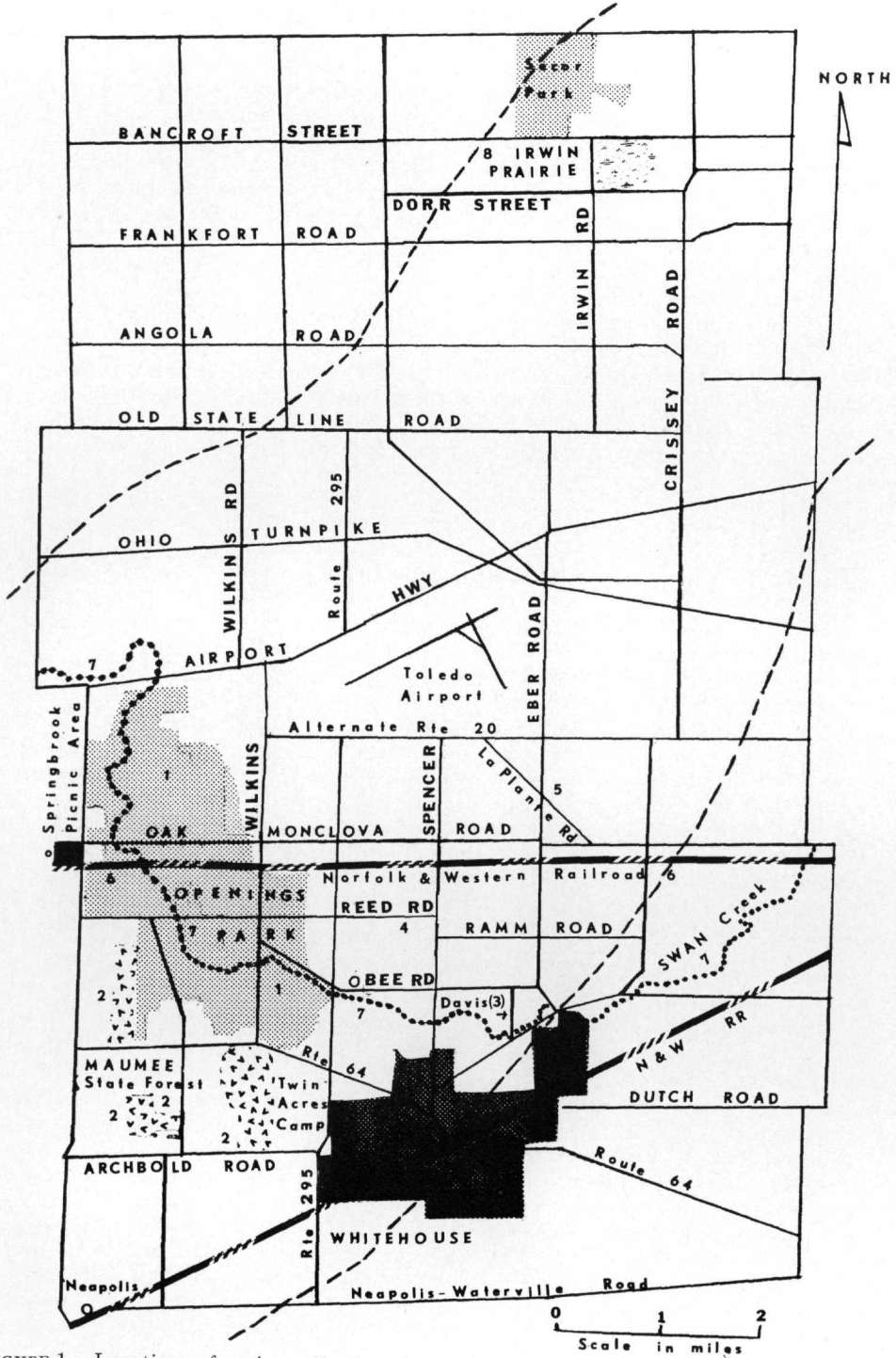


FIGURE 1. Locations of major collecting sites used in the present study. Location of site marked by site number (see text). Boundaries of Oak Openings shown by dashed lines (from Moseley, 1928). Map drawn by the author.

CYPERACEAE

- *1. *Bulbostylis capillaris* (L.) C. B. Clarke
 Braun: widespread in state, mainly in eastern counties
 NWE: frequent in relatively undisturbed sandy fields, July–September
 ELM: locally common, as *Stenophyllus capillaris* (L.) Britt.
2. *Carex albolutescens* Schwein.
 Braun: previously recorded in Lake County
 NWE: rare, in moist sandy field behind Twin Acres Camp on State Route 64, and at edge of wet woods along Davis Road, May–July
 ELM: not listed
3. *Carex amphibola* Steud. var. *turgida* Fern.
 Braun: common woodland species in Ohio
 NWE: infrequent in wet areas along Swan Creek and Springbrook Creek along Monclova Road, May–July
 ELM: not listed
4. *Carex annectans* Bickn. var. *xanthocarpa* (Bickn.) Wieg.
 Braun: Carroll, Hamilton, and Pickaway Counties
 NWE: rare at edge of wet woods along Davis Road, May–June
 ELM: not listed
- *5. *Carex aquatilis* Wahlenb. var. *altior* (Rydb.) Fern.
 Braun: Auglaize, Erie, Lake, Lorain, and Lucas Counties
 NWE: not observed
 ELM: rare; no specimens for study
6. *Carex artitecta* Mackenz.
 Braun: common woodland species in southern and eastern counties
 NWE: not observed
 ELM: listed as *Carex varia* with no comment
- *7. *Carex aurea* Nutt.
 Braun: Ashtabula, Erie, and Lucas Counties
 NWE: not observed
 ELM: scarce
8. *Carex bicknellii* Britt.
 Braun: northern and western in range
 NWE: rare in dry sand and along roadside, Girdham Road, May–June
 ELM: not listed
9. *Carex blanda* Dewey
 Braun: common woodland species in Ohio
 NWE: frequent in wet woods on Davis Road, May–July
 ELM: not listed
10. *Carex brevior* (Dewey) Mackenz.
 Braun: widely scattered in Ohio
 NWE: frequent in moist sand, June–July
 ELM: not listed
- *11. *Carex buxbaumii* Wahlenb.
 Braun: widely scattered in Ohio
 NWE: frequent in wet woods and ditches, May–July
 ELM: frequent, as *Carex polygama* Schkuhr
12. *Carex cephalophora* Muhl.
 Braun: common and widespread in Ohio
 NWE: infrequent in moist sand along David Road, May–June
 ELM: not listed
13. *Carex communis* Bailey
 Braun: widespread in southern and eastern counties
 NWE: rare in moist sand at edge of woods, May–June
 ELM: not listed

- *14. *Carex conoidea* Schkuhr
 Braun: Erie, Henry, Lake, Lucas, and Wood Counties
 NWE: rare along wet paths in sand on Davis Road, May-June
 ELM: rather frequent
15. *Carex convoluta* Mackenz.
 Braun: common woodland species in Ohio
 NWE: rare, in wet ditch along railroad near wet woods, May-June
 ELM: not listed
16. *Carex cristatella* Britt.
 Braun: common wet-woodland species in Ohio
 NWE: infrequent in wet woods and muck along Swan Creek, May-June
 ELM: not listed
17. *Carex cryptolepis* Mackenz.
 Braun: widely scattered, mainly in northeastern counties
 NWE: frequent in wet meadows of Irwin Prairie, and in wet ditches along railroad,
 June-August
 ELM: not listed
18. *Carex davisii* Schwein. & Torr.
 Braun: widespread in Ohio, mostly in western counties
 NWE: rare, on floodplain of Swan Creek, May-June
 ELM: not listed
19. *Carex emmonsii* Dewey
 Braun: confined to the lake area in Ohio
 NWE: infrequent in moist sand along Davis Road, May-June
 ELM: not listed
20. *Carex emoryi* Dewey
 Braun: widely scattered in glaciated parts of Ohio
 NWE: frequent in wet ditches along railroad, May-July
 ELM: not listed
21. *Carex gracilescens* Steud.
 Braun: widespread woodland species in Ohio
 NWE: infrequent in wet ditches along railroad, May-June
 ELM: not listed
22. *Carex gracillima* Schwein.
 Braun: common wet-woodland species in Ohio
 NWE: scarce in wet ditches along railroad, May-June
 ELM: scarce
23. *Carex granularis* Muhl.
 Braun: common in Ohio, usually in moist calcareous soil
 NWE: frequent in wet ditches and woods, on floodplain of Swan Creek, and in wet
 meadow of Irwin Prairie, June-July
 ELM: local
24. *Carex hirsutella* Mackenz.
 Braun: common woodland species, scarce in northwestern counties
 NWE: not observed
 ELM: frequent, as *Carex triceps* var. *hirsuta* (Willd.) Bailey
25. *Carex hyalinolepis* Steud.
 Braun: species reported from western or northwestern counties
 NWE: not observed
 ELM: not listed; but two specimens available for study: *J. A. Sanford 47670*, OS
 and *E. L. Moseley 4991*, OS
26. *Carex hystrixina* Muhl.
 Braun: widely scattered in Ohio, mostly in calcareous soils
 NWE: infrequent in wet ditches, May-June
 ELM: local

27. *Carex intumescens* Rudge
Braun: widespread in Ohio, mostly in northern counties
NWE: rare, in wet areas along Springbrook Creek and Swan Creek, June-August
ELM: not listed
28. *Carex lacustris* Willd.
Braun: widely scattered, mostly in northeastern counties
NWE: scarce in wet ditches and woods, June-July
ELM: scarce, as *Carex riparia* Curtis
- *29. *Carex lanuginosa* Michx.
Braun: widespread in western and northern counties
NWE: abundant in wet meadows and ditches, May-August
ELM: abundant
30. *Carex lasiocarpa* Ehrh. var. *americana* Fern.
Braun: widely scattered in Ohio
NWE: not observed
ELM: common on wet prairies, as *Carex filiformis* L.
31. *Carex leavenworthii* Dewey
Braun: widespread in woods and woodlands borders in Ohio
NWE: rare in moist sand on pond bank along Davis Road, May-June
ELM: not listed
32. *Carex longii* Mackenz.
Braun: included in *Carex albolutescens* Schwein. (see Fernald, 1950)
NWE: rare in moist sand at edge of wet woods, Reed Road, May-June
ELM: not listed
33. *Carex lupulina* Muhl.
Braun: common in swampy ground in Ohio
NWE: rare in moist sand, July-September
ELM: not found in typical Oak Openings
34. *Carex lurida* Wahlenb.
Braun: common in wet soil, mostly from southern and eastern counties
NWE: common in boggy habitat at Springbrook Picnic area, June-July
ELM: infrequent
35. *Carex molesta* Mackenz.
Braun: widely scattered, mainly in northern counties
NWE: common in moist sand, ditches, and fields, May-June
ELM: not listed
36. *Carex muhlenbergii* Schkuhr
Braun: widely scattered, mainly in northern counties
NWE: abundant in moist or dry sand, June-July
ELM: abundant
37. *Carex normalis* Mackenz.
Braun: common woodland species in Ohio
NWE: common in wet woods, ditches, meadows, June-July
ELM: not listed
38. *Carex pensylvanica* Lam.
Braun: common in dry oak woods
NWE: common in dry oak woods, May-June
ELM: common
39. *Carex rosea* Schkuhr
Braun: widespread woodland species in Ohio
NWE: scarce in wet woods, May-June
ELM: scarce
- *40. *Carex sartwellii* Dewey
Braun: Erie and Ross Counties
NWE: common in wet meadows and ditches, especially at Irwin Prairie, June-July
ELM: common along edges of swales

- *41. *Carex scoparia* Schkuhr
 Braun: widely scattered, common in northeastern counties
 NWE: common in moist sand, wet ditches, and meadows, May-July
 ELM: common
42. *Carex sparganioides* Muhl.
 Braun: common woodland species in Ohio
 NWE: rare on floodplain of Swan Creek, June-July
 ELM: not listed
- *43. *Carex spicata* Huds.
 Braun: naturalized from Europe along roadsides and in fields
 NWE: not observed
 ELM: rare, as *Carex muricata* L.
- *44. *Carex sterilis* Willd.
 Braun: Champaign, Erie, and Madison Counties
 NWE: not observed
 ELM: rare
45. *Carex stipata* Muhl.
 Braun: widespread in wet habitats
 NWE: frequent in wet woods and ditches, and on floodplain of Swan Creek, June-July
 ELM: frequent
46. *Carex stricta* Lam.
 Braun: widely scattered in Ohio
 NWE: rare in wet area along stream near U.S. Route 20A and Girdham Road, June-July
 ELM: rare, as *Carex stricta* Lam. and frequent, as *Carex stricta angustata* (Boott) Bailey
47. *Carex swanii* (Fern.) Mackenz.
 Braun: widespread in Ohio, mainly in northern counties
 NWE: frequent in moist sand and on floodplain of Swan Creek, June-July
 ELM: not listed
- *48. *Carex tenera* Dewey
 Braun: widely scattered in Ohio, mainly in northwestern counties
 NWE: frequent in wet woods and ditches, June-July
 ELM: frequent, as *Carex straminea* Willd.
49. *Carex tetanica* Schkuhr
 Braun: widely scattered, mainly in southern counties
 NWE: local, in wet ditch along railroad near Whitehouse-Spencer Road, May-June
 ELM: local
50. *Carex tribuloides* Wahlenb.
 Braun: widespread in Ohio
 NWE: infrequent in wet meadow at Irwin Prairie, June-July
 ELM: not found in typical Oak Openings
- *51. *Carex vesicaria* L.
 Braun: widely scattered, mainly in northeastern counties
 NWE: not observed
 ELM: frequent
52. *Carex vulpinoidea* Michx.
 Braun: common in every county of Ohio
 NWE: common in moist sand, wet ditches, and on floodplain of Swan Creek, June-July
 ELM: common
- *53. *Cladium mariscoides* (Muhl.) Torr.
 Braun: Champaign, Erie, Geauga, Lucas, and Portage Counties

- NWE: abundant in wet meadow at Irwin Prairie, elsewhere absent, August–September
ELM: rare
54. *Cyperus erythrorhizos* Muhl.
Braun: widespread in Ohio
NWE: frequent in moist sand and on floodplain of Swan Creek, August–September
ELM: not listed
55. *Cyperus esculentus* L.
Braun: common in Ohio
NWE: infrequent on floodplain of Swan Creek, August–September
ELM: listed with no comment
56. *Cyperus ferruginescens* Boeckl.
Braun: widely scattered in Ohio
NWE: not observed
ELM: not listed; but one specimen collected at later date: *Moseley 4752*, BGSU
57. *Cyperus filiculmis* Vahl
Braun: common in Ohio
NWE: common both in moist and dry sand, June–July
ELM: common
58. *Cyperus flavescens* L. var. *poaeformis* (Pursh) Fern.
Braun: widely scattered in Ohio, mainly in southern counties
NWE: not observed
ELM: frequent; two specimens from sand pit, Holland, Lucas County: *Moseley 4747, 4748*, BGSU
59. *Cyperus inflexus* Muhl.
Braun: widely scattered, records mainly from central counties
NWE: not observed
ELM: rare, as *Kyllinga pumila* Michx., shallow ditch and wet meadow in Spencer Township. Two specimens misidentified by Moseley: *Moseley 4982, 4983*, BGSU
60. *Cyperus rivularis* Kunth
Braun: widespread in Ohio
NWE: common in wet ditches, in moist sand, and in roadside gravel at Irwin Prairie, August–September
ELM: common, as *Cyperus diandrus* Torr. var. *castaneus* Torr.
61. *Cyperus strigosus* L.
Braun: common in Ohio
NWE: common in wet meadows, ditches, and woods, August–September
ELM: common
62. *Dulichium arundinaceum* (L.) Britt.
Braun: widespread in Ohio
NWE: not observed
ELM: listed with no comment
63. *Eleocharis acicularis* (L.) T. & S.
Braun: widespread in Ohio, mainly from eastern counties
NWE: not observed
ELM: rare; no specimens for study
- *64. *Eleocharis elliptica* Kunth
Braun: Erie, Lorain, Lucas, Pike, and Wood counties
NWE: common in wet ditches and meadow at Irwin Prairie, June–August
ELM: common, as *Eleocharis tenuis* (Willd.) Schult.
(see Svenson, 1957, in which *E. tenuis* is considered to be a more southern species and differs from *E. elliptica* by having greenish achenes)
- *65. *Eleocharis erythropoda* Steud.
Braun: frequent in calcareous soils; this species referred to as *Eleocharis calva* Torr. in Braun, 1957 (see Voss, 1966, and Harms, 1968)

- NWE: frequent in wet ditches, moist sand, and wet meadow at Irwin Prairie, June–August
 ELM: listed with no comment
66. *Eleocharis intermedia* (Muhl.) Schultes
 Braun: Erie, Fairfield, Franklin, and Ottawa Counties
 NWE: not observed
 ELM: frequent; no specimens for study
67. *Eleocharis obtusa* (Willd.) Schultes
 Braun: common in Ohio, although not recorded from many northwestern counties
 NWE: common in wet sand and wet woods, July–August
 ELM: listed with no comment, as *Eleocharis ovata* (Roth.) R. & S.
 (see Gleason and Cronquist, 1963, in which *E. ovata* and *E. obtusa* are lumped)
68. *Eleocharis smallii* Britt.
 Braun: widespread in Ohio, mainly in northern counties
 NWE: infrequent in wet ditches along Monclova Road, June–August
 ELM: listed with no comment, as *Eleocharis palustris* (L.) R. & S.
 (see Harms, 1968, for taxonomic treatment)
- *69. *Fimbristylis autumnalis* (L.) R. & S.
 Braun: widely scattered in Ohio, mainly in southern counties
 NWE: infrequent in moist sand, June–August
 ELM: common
70. *Hemicarpha micrantha* (Vahl) Pax
 Braun: Ashtabula, Jackson, Lucas, and Pickaway Counties
 NWE: rare, in wet roadside ditch along Reed Road, August
 ELM: not listed; but one specimen collected later: *Moseley 4980*, BGSU, August 19, 1928
71. *Rhynchospora alba* (L.) Vahl
 Braun: recorded mainly from northeastern counties
 NWE: not observed
 ELM: listed as frequent, but specimens were misidentified, annotated as *Rhynchospora capitellata* (Michx.) Vahl
- *72. *Rhynchospora capitellata* (Michx.) Vahl
 Braun: widely scattered in Ohio, mainly from southern counties and northern tier of counties
 NWE: common in moist sand, July–August
 ELM: common, as *Rhynchospora glomerata* (L.) Vahl
- *73. *Rhynchospora globularis* (Chap.) Small var. *recognita* Gale
 Braun: Erie, Lucas, and Ross Counties
 NWE: rare in moist sand, edge of wet woods, July–August
 ELM: infrequent, as *Rhynchospora cymosa* Ell.
74. *Scirpus acutus* Muhl.
 Braun: widely scattered in Ohio
 NWE: infrequent in wet meadow at Irwin Prairie and on floodplain of Swan Creek, August–September
 ELM: not listed
75. *Scirpus americanus* Pers.
 Braun: widespread in glaciated parts of Ohio
 NWE: rare in moist sand on floodplain of Swan Creek, August–September
 ELM: not listed
76. *Scirpus atrovirens* Willd.
 Braun: common throughout Ohio
 NWE: frequent in wet ditches, on floodplain of Swan Creek, and in wet meadow of Irwin Prairie, June–July
 ELM: frequent

77. *Scirpus cyperinus* (L.) Kunth
 Braun: common throughout Ohio
 NWE: frequent in wet ditches and moist sand, August–September
 ELM: frequent
78. *Scirpus hattorianus* Mak.
 Braun: not listed in Braun (1967), but recognized as species by Schuyler (1967); related to *Scirpus atrovirens* Willd.
 NWE: infrequent in wet woods and moist sand, June–August
 ELM: not listed
79. *Scirpus pendulus* Muhl.
 Braun: common throughout Ohio, referred to as *Scirpus lineatus* Michx. in Braun, 1967 (see Schuyler, 1966)
 NWE: common in wet ditch and wet meadow at Irwin Prairie, June–July
 ELM: not listed
80. *Scirpus polyphyllus* Vahl
 Braun: widespread in eastern counties of Ohio
 NWE: not observed
 ELM: listed with no comment
81. *Scirpus validus* Vahl var. *creber* Fern.
 Braun: common throughout Ohio
 NWE: common in wet ditches and wet meadows, and on floodplain of Swan Creek, June–August
 ELM: common
- *82. *Scleria pauciflora* Muhl.
 Braun: Adams, Jackson, Pike, and Ross Counties in southern Ohio and Erie and Lucas Counties in northern Ohio
 NWE: infrequent in moist sand, June–August
 ELM: frequent
- *83. *Scleria triglomerata* Michx.
 Braun: Adams and Jackson Counties in southern Ohio, Ashtabula, Erie, Lucas, Williams, and Wood Counties in northern Ohio
 NWE: frequent in moist sand, June–August
 ELM: common
- GRAMINEAE
84. *Agropyron repens* (L.) Beauv.
 Braun: introduced from Eurasia, abundant throughout Ohio
 NWE: common along roadsides, in fields, and in sand, June–August
 ELM: not listed
85. *Agrophyron trachycaulum* (Link) Malte
 Braun: widely scattered in Ohio, mainly in northern counties
 NWE: not observed
 ELM: frequent, as *Agropyron caninum* (L.) Beauv. and *Agropyron glaucum* R. & S.
- *86. *Agrostis alba* L.
 Braun: introduced from Europe for use in cultivation, common throughout Ohio
 NWE: abundant along roadsides, and in fields and pastures, June–July
 ELM: abundant
87. *Agrostis hyemalis* (Walt.) BSP.
 Braun: widely scattered in Ohio, mainly in southern and eastern counties
 NWE: common in moist sand and along roadsides, June–July
 ELM: common
- *88. *Agrostis perennans* (Walt.) Tuckerm.
 Braun: common throughout Ohio
 NWE: common in moist sand, at edge of wet woods, and on floodplain of Swan Creek, August–September
 ELM: common

89. *Agrostis scabra* Willd.
 Braun: widely scattered in eastern counties
 NWE: frequent in wet ditches along railroad and in moist sand along Reed Road, July–August
 ELM: species not recognized in seventh edition of Gray's Manual of Botany (1908)
90. *Alopecurus aequalis* Sobol.
 Braun: widely scattered, mainly in central and northeast counties
 NWE: not observed
 ELM: rather frequent
91. *Andropogon gerardi* Vitman
 Braun: common throughout Ohio
 NWE: common in dry fields along railroad and in Maumee State Forest, July–August
 ELM: abundant, as *Andropogon furcatus* Muhl.
92. *Andropogon scoparius* Michx.
 Braun: common throughout Ohio
 NWE: frequent in sand along Reed Road and in dry fields along railroad, July–August
 ELM: abundant
93. *Andropogon virginicus* L.
 Braun: widespread in Ohio, except for northwestern counties
 NWE: infrequent in dry fields and in sand, August–September
 ELM: not listed
94. *Aristida longespica* Poir.
 Braun: widely scattered in Ohio, mainly in southern counties
 NWE: infrequent in sand near pine plantings along Obee Road near State Route 295, September–October
 ELM: not listed
- *95. *Aristida purpurascens* Poir.
 Braun: widely scattered in five southern counties and in three northwestern counties
 NWE: frequent in moist or dry sand, August–September
 ELM: scarce
96. *Bromus ciliatus* L.
 Braun: widely scattered in Ohio
 NWE: frequent on floodplain of Swan Creek, July–August
 ELM: frequent
97. *Bromus commutatus* Schrad.
 Braun: naturalized from Europe, abundant in Ohio
 NWE: frequent in sandy fields and along roadsides, June–July
 ELM: not listed
98. *Bromus inermis* Leyss.
 Braun: naturalized from Europe, common in Ohio
 NWE: common on railroad embankments and along roadsides, June–July
 ELM: not listed
99. *Bromus japonicus* Thunb.
 Braun: naturalized from the Old World, widely scattered in Ohio
 NWE: rare in moist sand along Reed Road near Whitehouse–Spencer Road, June–July
 ELM: not listed
- *100. *Bromus kalmii* Gray
 Braun: widely scattered in Ohio
 NWE: infrequent along sandy roadsides and on railroad banks, July–August
 ELM: infrequent
101. *Bromus latiglumis* (Shear) Hitchc.
 Braun: common throughout Ohio

- NWE: infrequent along roadsides and on floodplain of Swan Creek, August-September
ELM: not listed
102. *Bromus secalinus* L.
Braun: naturalized from Europe, common throughout Ohio
NWE: not observed
ELM: not listed; but one specimen for study: *Arthur Brooks 70656*, OS
103. *Bromus tectorum* L.
Braun: naturalized from Europe, abundant throughout Ohio
NWE: abundant along sandy roadsides and on railroad banks, May-June
ELM: along railroads
104. *Calamagrostis canadensis* (Michx.) Beauv.
Braun: widespread in Ohio, but mainly in northern counties
NWE: common in wet ditches and wet meadow at Irwin Prairie, June-July
ELM: frequent
105. *Calamagrostis inexpansa* Gray
Braun: Erie, Lucas, and Ross Counties
NWE: infrequent in wet meadow or in wet ditches at Irwin Prairie, July-August
ELM: common
106. *Calamovilfa longifolia* (Hook.) Scribn. var. *magna* Scribn. & Merr.
Braun: not listed in Braun, 1967
NWE: rare on dry sand at southeast corner of Monclova and Wilkins Roads, July-August
ELM: not listed
- *107. *Cenchrus pauciflorus* Benth.
Braun: widely scattered in Ohio
NWE: abundant along sandy roadsides and on railroad banks, July-September
ELM: abundant, as *Cenchrus carolinianus* Walt.
108. *Cinna arundinacea* L.
Braun: common throughout Ohio
NWE: infrequent in wet ditches and on floodplain of Swan Creek, August-September
ELM: infrequent
109. *Dactylis glomerata* L.
Braun: naturalized from Europe, used as hay or pasture grass throughout Ohio
NWE: infrequent along roadsides, on railroad banks, and at edge of cultivated fields, June-July
ELM: listed with no comment
110. *Danthonia spicata* (L.) Beauv.
Braun: common throughout Ohio
NWE: common in sandy fields, along roadsides, and on railroad banks, June-July
ELM: common
111. *Digitaria ischaemum* (Schreb.) Muhl.
Braun: naturalized from Europe, common throughout Ohio
NWE: common in sandy fields and along roadsides, August-September
ELM: common, as *Digitaria humifusa* Pers.
112. *Digitaria sanguinalis* (L.) Scop.
Braun: naturalized from Europe, abundant throughout Ohio
NWE: abundant in sandy fields and along roadsides, August-September
ELM: abundant
113. *Echinochloa crusgalli* (L.) Beauv.
Braun: widespread throughout Ohio
NWE: infrequent in moist sand, August-September
ELM: common
114. *Echinochloa pungens* (Poir.) Rybd.
Braun: common throughout Ohio

- NWE: frequent in moist sand and ditches and on floodplain of Swan Creek, August-September
 ELM: not distinguished in 7th edition of Gray's Manual of Botany (1908)
115. *Eleusine indica* (L.) Gaertn.
 Braun: naturalized from Old World, common throughout Ohio
 NWE: infrequent in dry sand along Reed Road, June-August
 ELM: common
116. *Elymus villosus* Muhl.
 Braun: widespread in Ohio, except in northwestern counties
 NWE: not observed
 ELM: listed with no comment, as *Elymus striatus* Willd.
117. *Elymus virginicus* L.
 Braun: common throughout Ohio
 NWE: infrequent in wet meadow at Irwin Prairie, July-August
 ELM: listed with no comment
118. *Eragrostis capillaris* (L.) Nees
 Braun: widely scattered, mainly in southern counties
 NWE: rare, in sand along Reed Road, August-September
 ELM: not listed
119. *Eragrostis hypnoides* (Lam.) BSP.
 Braun: widespread in Ohio, mainly in southern and eastern counties
 NWE: rare on floodplain of Swan Creek, August-September
 ELM: not listed
120. *Eragrostis megastachya* (Koel.) Link
 Braun: naturalized from Europe, common throughout Ohio
 NWE: infrequent on floodplain of Swan Creek, June-August
 ELM: not listed
- *121. *Eragrostis pectinacea* (Michx.) Nees
 Braun: abundant throughout Ohio
 NWE: abundant in sandy fields and along roadsides, July-August
 ELM: abundant, as *Eragrostis pilosa* (L.) Beauv.
122. *Eragrostis spectabilis* (Pursh) Steud.
 Braun: widespread in Ohio, but scarce in western counties
 NWE: frequent in sandy fields and along roadsides, July-September
 ELM: not listed
123. *Festuca elatior* L.
 Braun: naturalized from Europe, used as hay or pasture grass, or for planting along highways
 NWE: common in wet ditches, at edge of wet woods, and along railroads, June-July
 ELM: not listed
124. *Festuca obtusa* Biehler
 Braun: common throughout Ohio
 NWE: common on floodplain of Swan Creek, at edge of wet woods, and in wet meadows, June-July
 ELM: listed with no comment, as *Festuca nutans* Spreng.
125. *Festuca octoflora* Walt.
 Braun: widely scattered in Ohio
 NWE: infrequent in moist sand and at edge of wet woods, May-June
 ELM: rare
126. *Festuca ovina* L.
 Braun: introduced species, occasionally found in dry places
 NWE: rare in sand along railroad, May-June
 ELM: not listed
127. *Festuca rubra* L.
 Braun: doubtfully native in Ohio, recorded from 15 widely scattered counties, used by highway department in seeding mixtures

- NWE: rare in moist sandy field behind Twin Acres Camp on State Route 64, May-June
ELM: not listed
128. *Glyceria borealis* (Nash) Batchelder
Braun: reported only from Lucas County
NWE: not observed
ELM: not listed; but one specimen collected by Moseley in wet places, August 2, 1925 *Moseley 5126*, BGSU)
129. *Glyceria canadensis* (Michx.) Trin.
Braun: recorded from counties of northeastern Ohio
NWE: infrequent in moist sand, July-August
ELM: infrequent
130. *Glyceria septentrionalis* Hitchc.
Braun: widely scattered, mainly in eastern counties
NWE: not observed
ELM: not listed; but two specimens available for study: *Moseley 5101*, BGSU, and *Bartley 62287*, OS.
131. *Glyceria striata* (Lam.) Hitchc.
Braun: abundant throughout Ohio
NWE: abundant in wet ditches and in wet meadow at Irwin Prairie, June-August
ELM: frequent, as *Glyceria nervata* (Willd.) Trin.
132. *Hierochloa odorata* (L.) Beauv.
Braun: widely scattered, mainly in central counties
NWE: rare in roadside ditch beside wet meadow at Irwin Prairie, May-July
ELM: not listed
133. *Hordeum jubatum* L.
Braun: widespread throughout Ohio, probably introduced
NWE: infrequent along sandy roadsides, June-July
ELM: not listed
134. *Hystrix patula* Moench
Braun: common in woodlands throughout Ohio
NWE: rare, observed in wet woods near Mallard Lake, Oak Openings Metropolitan Park, June-July
ELM: rare; one specimen for study: *Herrick 80214*, OS
- *135. *Koeleria macrantha* (Ledeb.) Schultes
Braun: Erie, Greene, Lucas, and Ottawa Counties, as *Koeleria cristata* (L.) Pers. (see Voss, 1966 and 1972)
NWE: common in dry sand, Monclova Road, July-August (fig. 2)
ELM: common
136. *Leersia oryzoides* (L.) Swartz
Braun: common throughout Ohio
NWE: frequent in wet ditches, on floodplain of Swan Creek, and in wet meadow at Irwin Prairie, August-September
ELM: in ditches
137. *Leersia virginica* Willd.
Braun: common throughout Ohio
NWE: infrequent on floodplain of Swan Creek and at edge of wet woods on Davis Road, July-August
ELM: local
138. *Leptoloma cognatum* (Schultes) Chase
Braun: widely scattered in Ohio
NWE: frequent in moist sand and along roadsides in Maumee State Forest, June-August
ELM: not listed
139. *Lolium perenne* L.
Braun: introduced from Europe as hay, pasture, or lawn grass

NWE: not observed

ELM: not listed; but one specimen for study: *Moseley 5130*, BGSU

140. *Milium effusum* L.

Braun: widely scattered, mainly in northeastern counties

NWE: not observed

ELM: rare in Spencer Township; *Moseley 5133*, BGSU



FIGURE 2. Two frequent dry-prairie species found in the Oak Openings sand: *Koeleria macrantha* (Ledeb.) Schultes (left), photographed on the southeast corner of Monclova and Wilkins Roads, and *Stipa spartea* Trin. (right), photographed on the southwest corner of Reed and Whitehouse-Spencer Roads.

141. *Muhlenbergia frondosa* (Poir.) Fern.

Braun: common throughout Ohio

NWE: frequent on floodplain of Swan Creek, August-September

ELM: frequent, as *Muhlenbergia mexicana* (L.) Trin.

142. *Muhlenbergia glomerata* (Willd.) Trin.

Braun: widely scattered in Ohio

- NWE: not observed
ELM: infrequent, as *Muhlenbergia racemosa* (Michx.) BSP.
- *143. *Muhlenbergia mexicana* (L.) Trin.
Braun: widespread in Ohio, but mainly in northern counties
NWE: frequent in moist ditches, wet woods, and on floodplain of Swan Creek,
September
ELM: frequent, as *Muhlenbergia foliosa* (R. & S.) Trin.
144. *Muhlenbergia schreberi* Gmel.
Braun: abundant throughout Ohio
NWE: not observed
ELM: frequent in woods southwest of Neapolis and along roadsides in Oak Openings
Metropolitan Park
145. *Panicum agrostoides* Spreng.
Braun: widely scattered in Ohio
NWE: frequent in wet meadow at Irwin Prairie, August–September
ELM: scarce
146. *Panicum boreale* Nash
Braun: Fulton, Jackson, Lucas, and Portage Counties
NWE: not observed
ELM: abundant; specimens misidentified, annotated as *Panicum sphaerocarpon* Ell.
147. *Panicum capillare* L.
Braun: common throughout Ohio
NWE: common in dry sand and along roadsides, especially in Maumee State Forest,
August–September
ELM: frequent
148. *Panicum clandestinum* L.
Braun: widespread in Ohio, mainly in eastern counties
NWE: common in dry places, especially in Maumee State Forest, June–August
ELM: common
- *149. *Panicum columbianum* Scribn.
Braun: widely scattered in Ohio
NWE: common along roadsides and in dry sand, June–August
ELM: common, as *Panicum tsugetorum* Nash
150. *Panicum depauperatum* Muhl.
Braun: widely scattered in Ohio, mainly from southern counties
NWE: frequent in dry sand and in fields, May–June
ELM: scarce
151. *Panicum dichotomiflorum* Michx.
Braun: abundant throughout Ohio
NWE: frequent in dry sand along roadsides, July–September
ELM: not listed
152. *Panicum dichotomum* L.
Braun: widespread in southern and eastern counties
NWE: not observed
ELM: infrequent
153. *Panicum flexile* (Gatt.) Scribn.
Braun: widely scattered in Ohio, mainly from south-central counties
NWE: not observed
ELM: infrequent
- *154. *Panicum lanuginosum* Ell., not typical variety
Braun: abundant throughout Ohio
NWE: abundant in dry sand and along roadsides, June–August
ELM: abundant, as *Panicum huachucae* Ashe and *Panicum implicatum* Scribn.
155. *Panicum latifolium* L.
Braun: widely scattered in Ohio

- NWE: frequent in roadside sand, June-July
ELM: frequent or common
156. *Panicum meridionale* Ashe
Braun: not recorded in Ohio
NWE: not observed
ELM: listed with no comment; no specimens for study
- *157. *Panicum oligosanthos* Schultes var. *scribnerianum* (Nash) Fern.
Braun: widely scattered in Ohio
NWE: common in dry sand and in fields, May-September
ELM: listed with no comment, as *Panicum oligosanthos* Schultes and *Panicum scribnerianum* Nash
158. *Panicum sphaerocarpon* Ell.
Braun: widely scattered in Ohio, mainly in southern counties
NWE: rare in moist sandy woods, May-June
ELM: abundant, as *Panicum boreale* Nash
159. *Panicum virgatum* L.
Braun: common throughout Ohio
NWE: rare in wet meadow at Irwin Prairie, collected by Cynthia Tryon, August-September
ELM: rare
- *160. *Paspalum ciliatifolium* Michx.
Braun: widespread in southern counties and northern lake-shore counties
NWE: infrequent in roadside sand and in dry fields, July-August
ELM: infrequent, as *Paspalum muhlenbergii* Nash and *Paspalum pubescens* Muhl.
161. *Phalaris arundinacea* L.
Braun: common throughout Ohio
NWE: frequent in wet ditches and boggy areas; one specimen of forma *variegata* (Parnell) Druce at Springbrook Picnic area: *Easterly 4605*, BGSU, June-July
ELM: rare
162. *Phleum pratense* L.
Braun: naturalized throughout Ohio, most important hay grass
NWE: common in fields and along roadsides, May-June
ELM: infrequent
163. *Phragmites australis* (Cav.) Steudel
Braun: widely scattered in Ohio, long known as *Phragmites communis* Trin. (see Voss, 1972)
NWE: not observed
ELM: infrequent in wet areas in Spencer Township
164. *Poa compressa* L.
Braun: naturalized from Europe, throughout Ohio
NWE: abundant along roadsides, sometimes used as a plant cover for poor soils, May-August
ELM: common
165. *Poa palustris* L.
Braun: widely scattered, mainly in northeastern counties
NWE: rare in boggy area at Springbrook Picnic parking lot, June-July
ELM: listed with no comment, as *Poa triflora* Gilib.
- *166. *Poa pratensis* L.
Braun: naturalized throughout Ohio, most widely used lawn grass
NWE: abundant along roadsides and railroads, May-June
ELM: abundant
167. *Poa trivialis* L.
Braun: naturalized throughout Ohio
NWE: infrequent in wet ditches and on floodplain of Swan Creek, June-July
ELM: not listed

168. *Secale cereale* L.
 Braun: a cultivated crop, sometimes present along roadsides
 NWE: rare along roadsides and at edge of cultivated fields, May-June
 ELM: not listed
169. *Setaria faberi* Herrm.
 Braun: introduced from China, rapidly spreading in Ohio (see Pohl, 1962)
 NWE: infrequent in railroad gravel and along roadsides, July-August
 ELM: not listed
170. *Setaria glauca* (L.) Beauv.
 Braun: naturalized from Europe, common throughout Ohio
 NWE: frequent in dry sand and in fields, June-August
 ELM: common in places (local)
171. *Setaria italica* (L.) Beauv.
 Braun: a cultivated plant, sometimes found along roadsides
 NWE: not observed
 ELM: not listed; but two specimens for study: *Selby 92707*, OS, and *Bartley 8426*, OS
172. *Setaria viridis* (L.) Beauv.
 Braun: naturalized from Europe, common throughout Ohio
 NWE: frequent in dry sand and along roadsides, May-August
 ELM: common in places (local)
173. *Sorghastrum nutans* (L.) Nash
 Braun: widespread throughout Ohio
 NWE: common in wet ditches and sand along railroad, August-September
 ELM: common
174. *Spartina pectinata* Link
 Braun: widespread throughout Ohio
 NWE: not observed in typical Oak Openings, present along Maumee River at Water-ville, August-September
 ELM: rare, as *Spartina michauxiana* Hitchc.
- *175. *Sphenopholis intermedia* Rydb.
 Braun: widespread throughout Ohio
 NWE: frequent at edge of wet woods and on floodplain of Swan Creek, May-June
 ELM: frequent, as *Sphenopholis obtusata* (Michx.) Scribn. (see Erdman, 1965)
176. *Sporobolus asper* (Michx.) Kunth
 Braun: widespread throughout Ohio
 NWE: not observed
 ELM: along New York Central Railroad
177. *Sporobolus cryptandrus* (Torr.) Gray
 Braun: widely scattered in Ohio, mainly in northern counties
 NWE: infrequent in dry sand along railroad, July-September
 ELM: near railroad
178. *Sporobolus neglectus* Nash
 Braun: widely scattered in glaciated part of Ohio
 NWE: not observed
 ELM: infrequent
179. *Sporobolus vaginiflorus* (Torr.) Wood
 Braun: common throughout Ohio
 NWE: rare on railroad gravel, September
 ELM: listed with no comment
- *180. *Stipa spartea* Trin.
 Braun: Erie, Fulton, and Lucas Counties
 NWE: frequent on stabilized sand, Monclova Road, May-June (fig. 2)
 ELM: infrequent
181. *Triodia flava* (L.) Smyth
 Braun: widespread throughout Ohio except for some northwestern counties

- NWE: frequent along sandy roadsides, August–September
ELM: not listed
182. *Triplasis purpurea* (Walt.) Chapm.
Braun: widely scattered in Ohio, mainly on the sandy shores of Lake Erie
NWE: frequent in dry sand along Monclova Road, August–September
ELM: not listed
183. *Triticum aestivum* L.
Braun: a cultivated crop, sometimes found along roadsides or at edge of fields
NWE: infrequent along railroads or in sandy fields, May–June
ELM: not listed
- JUNCACEAE
184. *Juncus acuminatus* Michx.
Braun: widespread in Ohio, except in northwestern counties
NWE: frequent in moist sandy field behind Twin Acres Camp on State Route 64,
May–July
ELM: frequent
- *185. *Juncus alpinus* Vill.
Braun: Cuyahoga, Erie, Lake, Lucas, and Ottawa Counties
NWE: not observed
ELM: listed with no comment as *Juncus alpinus insignis* Fries
- *186. *Juncus articulatus* L.
Braun: widely scattered in Ohio, mainly in southern counties
NWE: not observed
ELM: rare
- *187. *Juncus brachycarpus* Engelm.
Braun: widely scattered in Ohio, mainly in southern counties
NWE: frequent in moist sand and in wet meadows, June–July
ELM: frequent, as *Juncus scirpoides* Lam.
188. *Juncus brachycephalus* (Engelm.) Buchenau
Braun: widely scattered in Ohio
NWE: not observed
ELM: listed with no comment
189. *Juncus bufonius* L.
Braun: widely scattered in Ohio, mainly in northern counties
NWE: rare in moist sand along Monclova Road, June–August
ELM: rare
- *190. *Juncus canadensis* J. Gay
Braun: widely scattered in Ohio, mainly in northern counties
NWE: common in wet ditches and meadows, August–September
ELM: abundant
191. *Juncus dudleyi* Wieg.
Braun: widely scattered in Ohio, related to *Juncus tenuis* Willd.
NWE: abundant in wet ditches and meadows, June–August
ELM: not listed
192. *Juncus effusus* L.
Braun: widespread in Ohio, mainly in southern and eastern counties
NWE: frequent in wet ditches and on floodplain of Swan Creek, June–July
ELM: frequent
193. *Juncus greenei* Oakes & Tuckerm.
Braun: Lucas County, one specimen (*Moseley 5438*, BGSU) annotated by Braun
NWE: rare in moist sand along Reed Road and along Girdham Road near the rail-
road, June–July
ELM: Moseley's specimen (one annotated by Braun) identified as *Juncus tenuis*
Willd.
- *194. *Juncus marginatus* Rostk.
Braun: widely scattered in Ohio, mainly in southern counties

- NWE: infrequent in moist sand and wet ditches, July–August
ELM: common
195. *Juncus nodosus* L.
Braun: widely scattered in Ohio, in several northeastern counties
NWE: not observed
ELM: frequent; no specimens for study
196. *Juncus tenuis* Willd. var. *anthelatus* Wieg.
Braun: widely scattered in southern and eastern counties
NWE: infrequent at edge of wet woods, June–August
ELM: not listed as variety
- *197. *Juncus tenuis* Willd. var. *tenuis*
Braun: common throughout Ohio
NWE: abundant in wet ditches and along paths in open moist woods, June–August
ELM: abundant
198. *Juncus torreyi* Coville
Braun: widespread throughout Ohio
NWE: frequent in wet ditches and wet meadow at Irwin Prairie, July–August
ELM: frequent, as *Juncus nodosus* L. var. *megacephalus* Torr.
199. *Luzula caroliniae* S. Wats.
Braun: widely scattered in Ohio, mainly in northeastern counties
NWE: not observed
ELM: not listed; but one specimen for study: *Moseley 5378*, BGSU, identified as *Luzula vernalis* DC.
- *200. *Luzula multiflora* (Retz.) Lejeune var. *multiflora*
Braun: widely scattered in Ohio, mainly in northeastern counties
NWE: common in moist sand along railroad and at edge of wet woods, April–June
ELM: common, as *Luzula campestris* (L.) DC.

SPARGANIACEAE

201. *Sparganium americanum* Nutt.
Braun: widely scattered in southern and northeastern counties
NWE: not observed
ELM: local, as *Sparganium simplex* Huds.

XYRIDACEAE

- *202. *Xyris torta* Sm.
Braun: Gallia, Jackson, Lucas, Scioto, and Wood Counties
NWE: scarce in moist sand at edge of wet woods along Reed Road, July–August
ELM: scarce, as *Xyris flexuosa* Muhl.

DISCUSSION

The changes that are apparent from the annotated list may be summarized as follows:

- (1) 34 species observed or reported by Moseley (1928) were not seen by this investigator.
- (2) 57 species observed or reported by this investigator were not reported by Moseley.
- (3) 10 species are less frequent now than in Moseley's time (1928); 17 species are more frequent now than in Moseley's time.
- (4) 3 species were misidentified by Moseley. Other possible nomenclatural corrections were complicated by the lack of voucher specimens.

The following species or varieties were reported by Moseley (1928), but were not found during the present investigation. The frequency of occurrence, as used by Moseley, is placed after each name:

Cyperaceae

- Carex aquatilis altior*—rare, no specimens for study
Carex artitecta—listed with no comment
Carex aurea—scarce
Carex hirsutella—frequent
Carex lasiocarpa americana—common
Carex spicata—rare, an introduced species
Carex sterilis—rare
Carex vesicaria—frequent
Cyperus ferruginescens—one specimen for study
Cyperus flavescens poaeformis—frequent
Dulichium arundinaceum—listed with no comment
Eleocharis acicularis—rare, no specimens for study
Eleocharis intermedia—frequent, no specimens for study
Scirpus polyphyllus—listed with no comment

Gramineae

- Agropyron trachycaulum*—frequent
Alopecurus aequalis—rather frequent
Elymus villosus—listed with no comment
Glyceria septentrionalis—two specimens for study
Lolium perenne—one specimen for study, an introduced species
Milium effusum—rare
Muhlenbergia glomerata—infrequent
Muhlenbergia schreberi—frequent
Panicum dichotomum—infrequent
Panicum flexile—infrequent
Phragmites australis—infrequent
Spartina pectinata—rare
Sporobolus asper—along New York Central Railroad
Sporobolus neglectus—infrequent

Juncaceae

- Juncus alpinus*—listed with no comment
Juncus articulatus—rare
Juncus brachycephalus—listed with no comment
Juncus nodosus—frequent, no specimens for study
Luzula carolinae—one specimen for study

Sparganiaceae

- Sparganium americanum*—local

Reasons for these local extinctions are not known, but some possibilities include: (1) major changes in the marsh or bog habitats in northwest Ohio caused by construction of drainage ditches; (2) cutting and clearing of woods; (3) disruption of weedy habitats along roadsides and railroads, possibly eliminating some adventive species, and (4) loss of some species that normally are found in the hilly unglaciated parts of southeastern Ohio and are in the margins of their ranges in northwestern Ohio. Many of these species are listed by Moseley as rare, scarce, infrequent, or listed with no comment. The marsh or bog species include *Carex aquatilis altior*, *Carex aurea*, *Carex lasiocarpa americana*, *Carex sterilis*, *Dulichium arundinaceum*, *Alopecurus aequalis*, *Glyceria septentrionalis*, *Muhlenbergia glomerata*, *Panicum flexile*, *Phragmites australis*, *Spartina pectinata*, *Juncus alpinus*, *Juncus brachycephalus*, and *Juncus nodosus*. Species whose Ohio records are mainly from southern or eastern counties include: *Carex artitecta*, *Carex hirsutella*, *Cyperus*

flavescens poaeformis, *Scirpus polyphyllus*, *Milium effusum*, *Panicum dichotomum*, *Juncus articulatus*, *Luzula caroliniae*, and *Sparganium americanum*.

The following species or varieties were reported in this investigation (1972), but were not observed or reported by Moseley (1928):

Cyperaceae

- Carex albolutescens*—rare, a species of the Atlantic slope
Carex amphibola turgida—infrequent
Carex annectans xanthocarpa—rare
Carex bicknellii—rare, northern and western in range
Carex blanda—frequent
Carex brevior—frequent
Carex cephalophora—infrequent
Carex communis—rare, mainly in southern and eastern counties
**Carex convoluta*—rare, closely related to *Carex rosea*
Carex cristatella—infrequent
**Carex cryptolepis*—frequent, mainly in northeastern counties
Carex davisii—rare
**Carex emmonsii*—infrequent, closely related to *Carex artitecta*
**Carex emoryi*—frequent, closely related to *Carex stricta*
**Carex gracilescens*—infrequent
Carex intumescens—rare
Carex leavenworthii—rare
**Carex longii*—rare, closely related to *Carex albolutescens*
Carex lupulina—rare
**Carex molesta*—common
**Carex normalis*—common
Carex sparganioides—rare, on the floodplain of Swan Creek
**Carex swanii*—frequent
Carex tribuloides—infrequent
Cyperus erythrorhizos—frequent
**Scirpus acutus*—infrequent on floodplain of Swan Creek
Scirpus americanus—rare
**Scirpus hattorianus*—infrequent, closely related to *Scirpus atrovirens*
**Scirpus pendulus*—common

Gramineae

- Agropyron repens*—common, an introduced species
**Agrostis scabra*—frequent, closely related to *Agrostis hyemalis*
Andropogon virginicus—infrequent, mainly in southern and eastern counties
**Aristida longespica*—infrequent, mainly in southern counties
Bromus commutatus—frequent, an introduced species
**Bromus inermis*—common, an introduced species
Bromus japonicus—rare, an introduced species
**Bromus latiglumis*—infrequent on floodplain of Swan Creek
Calamovilfa longifolia—rare on dry sand, Monclova Road
**Echinochloa pungens*—frequent, closely related to *Echinochloa crusgalli*
Eragrostis capillaris—rare
Eragrostis hypnoides—rare on floodplain of Swan Creek
Eragrostis megastachya—infrequent on floodplain of Swan Creek, an introduced species
**Eragrostis spectabilis*—frequent
Festuca elatior—common, an introduced species
Festuca ovina—rare, an introduced species
Festuca rubra—rare, an introduced species

- Hierochloa odorata*—rare
Hordeum jubatum—infrequent, probably introduced
Leptoloma cognatum—frequent
Panicum dichotomiflorum—frequent
Poa trivialis—infrequent, an introduced species
 **Secale cereale*—rare, an escape from cultivation
 **Setaria faberi*—infrequent, an introduced species
Triodia flava—frequent
Triplasis purpurea—frequent
 **Triticum aestivum*—infrequent, an escape from cultivation

Juncaceae

Juncus dudleyi—abundant, closely related to *Juncus tenuis*

Twenty-one species in this list were not in the seventh edition of Gray's Manual of Botany (Robinson & Fernald, 1908) and obviously therefore, would not have been in Moseley's list. These species are indicated by an asterisk (*). Why the other species were not found by Moseley is not clear, but some possible explanations include:

(1) Sixty-five percent of the species in the above list are rare or infrequent. Some of them possibly could have been overlooked by Moseley.

(2) Thirteen species in the above list are introduced grass species. Either Moseley did not find specimens of these species, or perhaps they did not spread into this area until after the time of Moseley's work (1928).

(3) Some of the species are found more frequently in other parts of Ohio. For them, the Oak Openings region may represent a marginal habitat, from which they are easily eliminated. Three examples are *Carex communis*, *Andropogon virginicus*, and *Aristida longespica*.

(4) Some species found on the floodplain of Swan Creek may simply have become established there after the time of Moseley's work (1928). Three examples are *Carex sparganioides*, *Eragrostis hypnoides*, and *Eragrostis megastachya*.

There are 27 species in the present list that were collected by both Moseley and the author, but whose frequency of occurrence has changed since the time of Moseley (1928). These are listed below in two categories, those whose frequency has decreased since Moseley's work and those whose frequency has increased.

DECREASED FREQUENCY	Moseley (1928)	Easterly (1972)
<i>Carex conoidea</i>	frequent	rare
<i>Fimbristylis autumnalis</i>	common	infrequent
<i>Rhynchospora globularis</i>	infrequent	rare
<i>Scleria pauciflora</i>	frequent	infrequent
<i>Scleria triglomerata</i>	common	frequent
<i>Andropogon gerardi</i>	abundant	common
<i>Andropogon scoparius</i>	abundant	frequent
<i>Calamagrostis inexpansa</i>	common	infrequent
<i>Eleusine indica</i>	common	infrequent
<i>Juncus canadensis</i>	abundant	common
INCREASED FREQUENCY	Moseley (1928)	Easterly (1972)
<i>Carex granularis</i>	local	frequent
<i>Carex lurida</i>	infrequent	common
<i>Cladium mariscoides</i>	rare	local
<i>Aristida purpurascens</i>	scarce	frequent

<i>Calamagrostis canadensis</i>	frequent	common
<i>Festuca octoflora</i>	rare	infrequent
<i>Glyceria striata</i>	frequent	abundant
<i>Leersia virginica</i>	local	infrequent
<i>Panicum agrostoides</i>	scarce	frequent
<i>Panicum capillare</i>	frequent	common
<i>Panicum depauperatum</i>	scarce	frequent
<i>Phalaris arundinacea</i>	rare	frequent
<i>Phleum pratense</i>	infrequent	common
<i>Poa compressa</i>	common	abundant
<i>Setaria glauca</i>	local	frequent
<i>Setaria viridis</i>	local	frequent
<i>Stipa spartea</i>	infrequent	frequent

All of the sedge species in the decreased frequency list are found in very few counties in Ohio. *Fimbristylis autumnalis* is found mainly in southern Ohio. Any change in habitat conditions, such as the drainage brought about by the ditches, may take its toll with these species. The reason for the decreased frequency of certain of the grasses and of *Juncus canadensis* is not definitely known, but destruction of natural habitats by modern suburban developments may provide some of the answers. *Andropogon gerardi* and *Andropogon scoparius* are confined mostly to railroad banks or to dry fields very close to the railroads.

All of the species listed in the increased-frequency list do well in certain habitats that are present within the Oak Openings region of Lucas County, Ohio; why Moseley reported these plants to be less abundant is not known. Many may have responded favorably to the drainage and clearing that have gone on in recent years. Some of these are species that are frequent or common in wet areas; these are: *Carex granularis*, *Carex lurida*, *Cladium mariscoides*, *Calamagrostis canadensis*, *Glyceria striata*, *Panicum agrostoides*, and *Phalaris arundinacea*. *Cladium mariscoides* and *Calamagrostis canadensis* both are present in abundance in the wet meadows of Irwin Prairie. Some species such as *Leersia virginica* are present on the floodplain of Swan Creek and appear to be more frequent now than in Moseley's time (1929), though no reason for this is apparent. Species that are more frequent or common in the dry sandy habitats include: *Aristida purpurascens*, *Festuca octoflora*, *Panicum capillare*, *Panicum depauperatum*, *Setaria glauca*, *Setaria viridis*, and *Stipa spartea*. *Phleum pratense* is used extensively as a pasture or hay grass, and *Poa compressa* is used extensively in seeding mixtures to cover sterile soils.

As far as can be determined, Moseley made three mistakes in identification. The first mistaken species was listed by Moseley (1928) as *Kyllinga pumila* Michx. The correct identification should have been *Cyperus aristatus* Rottb. Today, in Braun (1967), these species are listed as *Cyperus tenuifolius* (Steud.) Dandy and *Cyperus inflexus* Muhl., respectively. The second mistake was *Rhynchospora alba* (L.) Vahl. The correct identification should have been *Rhynchospora glomerata* (L.) Vahl. In *The Monocotyledoneae* (Braun, 1967), this latter species is called *Rhynchospora capitellata* (Michx.) Vahl. Moseley misidentified *Panicum sphaerocarpon* Ell. as *Panicum boreale* Nash. *Panicum boreale* is a northern species and is much less frequent than is *Panicum sphaerocarpon* in Ohio.

One confusing report by Moseley is *Eleocharis intermedia* (Muhl.) Schultes. Moseley lists this species as frequent, but there are no voucher specimens to confirm the claim. No specimens were collected during the present investigation. Previously this species had been collected in only four Ohio counties: Erie, Fairfield, Franklin, and Ottawa. This lack of voucher specimens has been a major problem in interpreting some of Moseley's reports (see Easterly, 1972).

SUMMARY

Of the 202 species listed in this study, 34 reported by Moseley in 1928 were not found by the present investigator. Possible reasons for these local extinctions may be: (1) major changes in the marsh or bog habitats caused by construction of drainage ditches, (2) cutting and clearing of woods, (3) disruption of weedy habitats along roadsides and railroads, possibly eliminating some adventive species, and (4) loss in the margins of their ranges of some species that normally are found in the hilly unglaciated parts of Ohio.

Fifty-seven species reported by the present investigator were not listed by Moseley. Twenty-one of these species were not listed in the seventh edition of Gray's Manual of Botany (Robinson and Fernald, 1908), which Moseley used as a reference. Sixty-five percent of these 57 species are rare or infrequent. Some of them could have been overlooked by Moseley. Twenty-three percent are introduced grass species that may have come into the Oak Openings since Moseley's work in 1928. Three species (*Carex communis*, *Andropogon virginicus*, and *Aristida longespica*) are more frequent in other parts of the state. For them the Oak Openings region may represent a habitat marginal to their major ranges, so that they are not always present. For three species (*Carex sparganioides*, *Eragrostis hypnoides*, and *Eragrostis megastachya*) the floodplain of Swan Creek provides a good habitat on which to flourish.

Changes in the frequency of occurrence of 27 species found both by Moseley (1928) and myself appear to be due to the elimination of habitats as the Oak Openings region has become increasingly urbanized or suburbanized. The 17 species which show increased frequency occur on the floodplain of Swan Creek, in the wet ditches and on the banks of the Norfolk and Western Railroad right-of-way, along newly constructed roadsides, and on dry sandy sites.

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