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Plant Communities of Southeastern Iowa

ROBERT A. DAVIDSON¹

Abstract. Twenty-four localities, or general habitat types, in southeastern Iowa and their associated plant communities are identified.

Botanically inclined readers of the *Proceedings of the Iowa Academy of Science* may in recent years have noted an upswing in the number of contributions pertaining to the natural vegetation of Iowa. A growing number of persons, from several institutions, has been involved in these studies and some of the work already has received support from such agencies as the National Science Foundation and the Old Gold Development Fund.² This paper is offered as another in this series of studies intended to elucidate various aspects of the Iowa flora.

The field exploration which provided the data contained in this paper was begun in the fall of 1952. Several months were spent in the field during the growing seasons of 1953 and 1955, but most of the materials and observations were gathered during the 1954 season. Notes on the flora in general, and in particular the habitats considered below, were taken, and some 4,400 collections totaling an estimated 9,000 individual specimens were made. A set of voucher specimens is on deposit in the Herbarium of the State University of Iowa.

The area studied and considered "southeastern Iowa" included fourteen counties: Appanoose, Davis, Des Moines, Henry, Jefferson, Keokuk, Lee, Louisa, Mahaska, Monroe, Muscatine, Van Buren, Wapello, and Washington. The area basically is delimited politically, not naturally.

Although of paramount importance in the total picture of communities, data reflecting environmental conditions have been presented elsewhere (Davidson, 1957 and 1959) and are therefore omitted here. Shimek (1948) has considered the principal environmental factors which govern the composition of plant communities to be the following:

- I. Edaphic or local factors.
 1. Topography and drainage.
 2. Soils.

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²The impetus behind this work undeniably has been Dr. Robert F. Thorne. The writer's appreciation is extended to Dr. Thorne for his help during the course of graduate studies (Davidson, 1957), parts of which have provided the basis of this paper.

II. Climatic or meteorological factors, often locally greatly modified by the edaphic factors.

3. Light.
4. Temperature.
5. Moisture.
6. Winds.

III. Biotic or living factors.

7. Plants.
8. Animals, including man.

Most species that grow without cultivation in southeastern Iowa comprise a vegetation which mostly is grassland or woodland. Some species may form a shrubby cover bordering wooded areas. Other species are restricted to sandy areas or rock ledges. Still others grow emersed or submersed in water. Generally disturbed, or waste, areas usually are covered by a mixture of naturalized weeds. Many plants, especially the weeds, show a considerable tolerance to a wide range of environmental differences—such species can survive in many diverse habitats. The majority of species, however, usually are restricted to one or a few similar habitats where environmental factors are compatible with rather narrowly limited tolerances. The several to many species which grow and reproduce together in a particular habitat can be termed a plant community. The boundaries of such communities may or may not be clearly defined.

During the course of my studies on the flora of southeast Iowa, 110 stations were studied more or less intensively. Below are identified 24 localities, or general habitat types, which support plant communities of special botanical interest. The characteristic or common plants of these localities are given. Some of the communities listed are rather typical of many others in the area, some are quite unique in themselves.

To conserve space, and since nomenclature closely follows that of Fernald (1950) and Gleason (1952), authority names are omitted.

1. Alluvial woods. Two typical examples are: Big Timber area along the Mississippi River, T-75N, R-2W, Louisa County; and Keever's Lake area, T-73N, R-2W, Louisa County.

Acalypha rhomboidea
Acer negundo
Acer saccharinum
Amaranthus tamariscinus
Amorpha fruticosa
Arabis perstollata
Arisaema dracontium
Aster ontarionis
Betula nigra
Bidens cernua
Bidens frondosa
Carex grayii
Carex lupulina
Carex muskingumensis
Carex typhina
Carya illinoensis

Carya laciniosa
Celtis occidentalis
Chacrophyllum procumbens
Cornus drummondii
Elymus virginicus
Eragrostis hypnoides
Euonymus atropurpureus
Fraxinus pennsylvanica
Galium aparine
Gleditsia triacanthos
Gymnocladus dioica
Humulus lupulus
Iodanthus pinnatifidus
Impatiens capensis
Impatiens pallida
Ipomoea pandurata

<i>Juglans nigra</i>	<i>Quercus macrocarpa</i>
<i>Leersia virginica</i>	<i>Quercus palustris</i>
<i>Lippia lanceolata</i>	<i>Rhus radicans</i>
<i>Lobelia cardinalis</i>	<i>Ruellia strepens</i>
<i>Lysimachia nummularia</i>	<i>Salix nigra</i>
<i>Lytchrum alatum</i>	<i>Sambucus canadensis</i>
<i>Menispermum canadense</i>	<i>Sicyos angulatus</i>
<i>Mertensia virginica</i>	<i>Smilax hispida</i>
<i>Morus rubra</i>	<i>Solidago gigantea</i>
<i>Muhlenbergia frondosa</i>	<i>Stachys tenuifolia</i>
<i>Parthenocissus quinquefolia</i>	<i>Ulmus americana</i>
<i>Pilea pumila</i>	<i>Urtica dioica</i>
<i>Platanus occidentalis</i>	<i>Verbena urticifolia</i>
<i>Polygonum pensylvanicum</i>	<i>Verbesina alternifolia</i>
<i>Polygonum virginianum</i>	<i>Vernonia fasciculata</i>
<i>Populus deltoides</i>	<i>Vitis cinerea</i>
<i>Quercus bicolor</i>	<i>Vitis riparia</i>
<i>Quercus imbricaria</i>	

2. Rich, loamy ravines at Lacey-Keosauqua State Park, Van Buren County.

<i>Acer saccharum</i>	<i>Galium triflorum</i>
<i>Adiantum pedatum</i>	<i>Geranium maculatum</i>
<i>Aesculus glabra</i>	<i>Geum canadense</i>
<i>Allium tricoccum</i>	<i>Hepatica acutiloba</i>
<i>Amphicarpa bracteata</i>	<i>Hystrix patula</i>
<i>Aralia racemosa</i>	<i>Juglans nigra</i>
<i>Arisaema triphyllum</i>	<i>Mitella diphylla</i>
<i>Asarum canadense</i>	<i>Osmorhiza claytonii</i>
<i>Asclepias quadrifolia</i>	<i>Ostrya virginiana</i>
<i>Athyrium filix-femina</i>	<i>Panicum latifolium</i>
<i>Blephilia ciliata</i>	<i>Parthenocissus quinquefolia</i>
<i>Botrychium virginianum</i>	<i>Phryma leptostachya</i>
<i>Brachyelytrum erectum</i>	<i>Podophyllum peltatum</i>
<i>Carex laxiflora</i>	<i>Polemonium reptans</i>
<i>Bromus purgans</i>	<i>Polygonatum commutatum</i>
<i>Carex hirtifolia</i>	<i>Prenanthes alba</i>
<i>Carex rosea</i>	<i>Prunus serotina</i>
<i>Carya cordiformis</i>	<i>Quercus alba</i>
<i>Caulophyllum thalictroides</i>	<i>Quercus rubra</i>
<i>Celastrus scandens</i>	<i>Rhus radicans</i>
<i>Cercis canadensis</i>	<i>Sanguinaria canadensis</i>
<i>Circaea quadrisulcata</i>	<i>Sanicula canadensis</i>
<i>Claytonia virginica</i>	<i>Sanicula gregaria</i>
<i>Cystopteris fragilis</i>	<i>Smilacina racemosa</i>
<i>Dentaria laciniata</i>	<i>Smilax herbacea</i>
<i>Desmodium glutinosum</i>	<i>Smilax hispida</i>
<i>Diarrhena americana</i>	<i>Solidago flexicaulis</i>
<i>Dicentra cucullaria</i>	<i>Solidago ulmifolia</i>
<i>Dioscorea villosa</i>	<i>Thalictrum dasycarpum</i>
<i>Elymus villosus</i>	<i>Tilia americana</i>
<i>Eupatorium rugosum</i>	<i>Ulmus rubra</i>
<i>Festuca obtusa</i>	<i>Uvularia grandiflora</i>
<i>Fraxinus americana</i>	<i>Viola pubescens</i>
<i>Galium circaeans</i>	<i>Viola sororia</i>
<i>Galium concinnum</i>	<i>Woodsia obtusa</i>

3. Rich wooded bluffs overlooking Mississippi River, between Montrose and Galland, Montrose Township, Lee County.

<i>Acer saccharum</i>	<i>Dicentra cucullaria</i>
<i>Aesculus glabra</i>	<i>Lactuca floridana</i>
<i>Amelanchier arborea</i>	<i>Menispermum canadense</i>
<i>Asimina triloba</i>	<i>Morus rubra</i>
<i>Aster shortii</i>	<i>Ostrya virginiana</i>
<i>Carex hirtifolia</i>	<i>Parthenocissus quinquefolia</i>
<i>Carya ovata</i>	<i>Prunus serotina</i>
<i>Carya tomentosa</i>	<i>Quercus rubra</i>
<i>Cercis canadensis</i>	<i>Rhus radicans</i>
<i>Claytonia virginica</i>	<i>Sanguinaria canadensis</i>
<i>Cystopteris fragilis</i>	<i>Solidago flexicaulis</i>
<i>Eupatorium rugosum</i>	<i>Staphylea trifolia</i>
<i>Fraxinus americana</i>	<i>Tilia americana</i>
<i>Gymnocladus dioica</i>	<i>Ulmus rubra</i>
<i>Hystrix patula</i>	

4. Rich, moist or dry, woods, Wildcat Den State Park, Muscatine County.

<i>Acer saccharum</i>	<i>Galium circaeazans</i>
<i>Actaea alba</i>	<i>Galium triflorum</i>
<i>Adiantum pedatum</i>	<i>Geranium maculatum</i>
<i>Allium tricoccum</i>	<i>Geum canadense</i>
<i>Amphicarpa bracteata</i>	<i>Hepatica acutiloba</i>
<i>Anemonella thalictroides</i>	<i>Hydrophyllum virginianum</i>
<i>Aquilegia canadensis</i>	<i>Hystrix patula</i>
<i>Arisaema triphyllum</i>	<i>Impatiens pallida</i>
<i>Asarum canadense</i>	<i>Juglans cinerea</i>
<i>Athyrium filix-femina</i>	<i>Juglans nigra</i>
<i>Athyrium thelypteroides</i>	<i>Laportea canadensis</i>
<i>Botrychium virginianum</i>	<i>Liparis liliifolia</i>
<i>Brachyelytrum erectum</i>	<i>Matteuccia struthiopteris</i>
<i>Bromus pürgans</i>	<i>Menispermum canadense</i>
<i>Cacalia muhlenbergii</i>	<i>Mitella diphylla</i>
<i>Campanula americana</i>	<i>Oryzopsis racemosa</i>
<i>Carex albursina</i>	<i>Osmorhiza claytonii</i>
<i>Carex cephalophora</i>	<i>Osmunda claytoniana</i>
<i>Carex grisea</i>	<i>Ostrya virginiana</i>
<i>Carex hirtifolia</i>	<i>Panax quinquefolius</i>
<i>Carex jamesii</i>	<i>Parthenocissus quinquefolia</i>
<i>Carex laxiculmis</i>	<i>Phlox divaricata</i>
<i>Carex laxiflora</i>	<i>Phryma leptostachya</i>
<i>Carex normalis</i>	<i>Podophyllum peltatum</i>
<i>Carex rosea</i>	<i>Polygonatum canaliculatum</i>
<i>Carex sparganioides</i>	<i>Polygonum virginianum</i>
<i>Carpinus caroliniana</i>	<i>Polystichum acrostichoides</i>
<i>Carya cordiformis</i>	<i>Prunus americana</i>
<i>Caulophyllum thalictroides</i>	<i>Prunus serotina</i>
<i>Celastrus scandens</i>	<i>Quercus alba</i>
<i>Circaea quadrisculata</i>	<i>Quercus rubra</i>
<i>Cornus alternifolia</i>	<i>Ranunculus recurvatus</i>
<i>Crataegus margareta</i>	<i>Rhus radicans</i>
<i>Crataegus mollis</i>	<i>Rubus allegheniensis</i>
<i>Cystopteris bulbifera</i>	<i>Rubus occidentalis</i>
<i>Cystopteris fragilis</i>	<i>Sanguinaria canadensis</i>
<i>Desmodium cuspidatum</i>	<i>Sanicula gregaria</i>
<i>Desmodium glutinosum</i>	<i>Smilacina racemosa</i>
<i>Desmodium nudiflorum</i>	<i>Smilax ecirrhata</i>
<i>Dicentra cucullaria</i>	<i>Smilax hispida</i>
<i>Dryopteris hexagonoptera</i>	<i>Solidago flexicaulis</i>
<i>Dryopteris spinulosa</i>	<i>Tilia americana</i>
<i>Elymus villosus</i>	<i>Ulmus rubra</i>
<i>Euonymus atropurpureus</i>	<i>Vitis riparia</i>
<i>Eupatorium purpureum</i>	<i>Uvularia grandiflora</i>
<i>Festuca obtusa</i>	<i>Viola pensylvanica</i>
<i>Fraxinus americana</i>	<i>Viola sororia</i>
<i>Fraxinus nigra</i>	

5. Moist limestone ledges and rich wooded calcareous slopes. Good examples are to be found at Oakland Mills State Park, Sec. 24, T-71N, R-7W, Henry County, and along Rock Creek, approximately one and one-half miles NNW of Hillsboro, T-70N, R-8W, Van Buren County.

<i>Actaea pachypoda</i>	<i>Cystopteris fragilis</i>
<i>Actaea rubra</i>	<i>Dicentra cucullaria</i>
<i>Adiantum pedatum</i>	<i>Elymus villosus</i>
<i>Aesculus glabra</i>	<i>Festuca obtusa</i>
<i>Amelanchier arborea</i>	<i>Galium triflorum</i>
<i>Anemonella thalictroides</i>	<i>Geranium maculatum</i>
<i>Aquilegia canadensis</i>	<i>Hepatica acutiloba</i>
<i>Arabis hirsuta</i>	<i>Hystrix patula</i>
<i>Aralia racemosa</i>	<i>Juglans cinerea</i>
<i>Arenaria lateriflora</i>	<i>Lonicera prolifera</i>
<i>Arisaema triphyllum</i>	<i>Menispermum canadense</i>
<i>Asarum canadense</i>	<i>Orchis spectabilis</i>
<i>Botrychium virginianum</i>	<i>Ostrya virginiana</i>
<i>Carex laxiflora</i>	<i>Panicum latifolium</i>
<i>Carpinus caroliniana</i>	<i>Parietaria pensylvanica</i>
<i>Carya cordiformis</i>	<i>Pellaea atropurpurea</i>
<i>Celastrus scandens</i>	<i>Phryma leptostachya</i>
<i>Cornus alternifolia</i>	<i>Polemonium reptans</i>
<i>Cystopteris bulbifera</i>	<i>Polystichum acrostichoides</i>

Prenanthes alba
Quercus alba
Quercus muhlenbergii
Quercus rubra
Sanguinaria canadensis
Smilacina stellata
Smilax hispida

Staphylea trifolia
Tilia americana
Trillium nivale
Uvularia grandiflora
Veratrum woodii
Viburnum molle
Woodsia obtusa

6. Rich, wooded, calcareous bluff overlooking Mississippi River floodplain, SE $\frac{1}{4}$ Sec. 11, T-72N, R-2W, Des Moines County.

Acer saccharum
Aesculus glabra
Aquilegia canadensis
Arabis hirsuta
Arisaema triphyllum
Carex cephalophora
Carex grvida
Carex grisea
Carex laxiflora
Carya ovata
Celastrus scandens
Cystopteris bulbifera
Dicentra cucullaria
Dioscorea villosa
Elymus villosus
Festuca obtusa
Fraxinus americana
Fraxinus quadrangulata
Galium triflorum
Gymnocladus dioica

Humulus lupulus
Hystrix patula
Menispermum canadense
Parthenocissus quinquefolia
Pellaea atropurpurea
Phryma leptostachya
Podophyllum peltatum
Polemonium reptans
Polygonatum commutatum
Prunus serotina
Quercus muehlenbergii
Rhus radicans
Sanicula canadensis
Smilax hispida
Sphenopholis intermedia
Tilia americana
Ulmus americana
Viola sororia
Xanthoxylum americanum

7. Dry, wooded bluffs adjacent to bridge over Des Moines River, WSW of Keokuk, NE $\frac{1}{4}$ Sec. 33, T-65N, R-5W, Lee County.

Aesculus glabra
Amelanchier arborea
Ampelopsis cordata
Campsis radicans
Carex granularis
Carex muhlenbergii
Carya ovata
Carya tomentosa
Cercis canadensis
Crataegus crus-galli
Dioscorea villosa
Eupatorium altissimum
Eupatorium purpureum
Euphorbia corollata
Fraxinus americana
Fraxinus quadrangulata
Galium circaezans
Heliopsis helianthoides
Hypericum punctatum
Ipomoea pandurata

Juniperus virginiana
Quercus muehlenbergii
Lespedeza capitata
Lespedeza virginica
Polygonatum commutatum
Prunus hortulana
Quercus imbricaria
Quercus macrocarpa
Rhus aromatica
Rubus allegheniensis
Sassafras albidum
Silene stellata
Sisyrinchium angustifolium
Solidago flexicaulis
Symphoricarpos orbiculatus
Ulmus americana
Verbesina alternifolia
Vernonia baldwinii
Vitis vulpina

8. Dry upland woods, approximately one-half mile west of Mooar's Station, SW $\frac{1}{4}$ Sec. 4, T-65N, R-5W, Lee County.

Agrimonia gryposepala
Agrostis perennans
Amorpha canescens
Andropogon scoparius
Anemone virginiana
Anemonella thalictroides
Aristida dichotoma
Aristida longespica
Aster pilosus
Aster turbinellus
Bromus purgans
Carex brevior
Carex cephalophora
Carex complanata
Carex muhlenbergii
Carya ovata
Carya tomentosa
Ceanothus americanus
Cirsium discolor

Corylus americana
Crotalaria sagittalis
Danthonia spicata
Desmodium paniculatum
Desmodium sessilifolium
Euphorbia corollata
Festuca obtusa
Fraxinus americana
Gerardia tenuifolia
Hedeoma pulegioides
Hieracium scabrum
Hypericum punctatum
Hystrix patula
Juniperus virginiana
Lespedeza virginica
Liatris aspera
Lobelia inflata
Muhlenbergia schreberi
Ostrya virginiana

Panicum implicatum
Panicum latifolium
Panicum virgatum
Parthenocissus quinquefolia
Polygonum tenue
Quercus alba
Quercus × *bushii*
Quercus imbricaria
Quercus stellata
Rubus allegheniensis

Rubus flagellaris
Ruellia humilis
Sanicula gregaria
Solidago nemoralis
Solidago ulmifolia
Strophostyles leiosperma
Triodanis perfoliata
Ulmus rubra
Viburnum lentago

9. Dry, loessial prairie adjacent to Agency Cemetery, T-72N, R-13W, Wapello County.

Amorpha canescens
Aster laevis
Eryngium yuccifolium
Echinacea pallida
Helianthemum bicknellii
Hypericum punctatum
Lespedeza violacea
Liatris aspera

Petalostemon candidus
Penstemon pallidus
Parthenium integrifolium
Salix humilis
Silphium integrifolium
Solidago nemoralis
Solidago rigida
Vernonia baldwinii

10. Mezic prairie remnant between Iowa Highway 92 and railway east of Cotter, T-75N, R-5W, Louisa County.

Amorpha canescens
Apocynum cannabinum
Achillea millefolium
Asclepias hirtella
Asclepias syriaca
Asclepias tuberosa
Asclepias verticillata
Aster azureus
Ceanothus americanus
Carex meadii
Coreopsis palmata
Dodecatheon meadia
Desmodium illinoense
Echinacea pallida
Elymus canadensis
Equisetum laevigatum
Erigeron strigosus
Eryngium yuccifolium
Euphorbia corollata

Helianthus laetiflorus
Heuchera richardsonii
Hypericum sphaerocarpum
Krigia biflora
Liatris aspera
Liatris pycnostachya
Lithospermum canescens
Monarda fistulosa
Oxalis violacea
Petalostemon purpureus
Phlox pilosa
Polygala verticillata
Pycnanthemum flexuosum
Ratibida pinnata
Rudbeckia hirta
Salix humilis
Sisyrinchium campestre
Solidago altissima
Viola pedatifida

11. Shallow water and wet, often marshy, margins of ponds along Mississippi and Iowa rivers. Typical examples are: Ray Lake, Sec. 29, T-72N, R-1W, Des Moines County; Keevers Lake, Secs. 7 and 8, T-73N, R-2W, Louisa County; and a small pond WSW of Ft. Madison, Secs. 12, 13, and 14, T-67N, R-5W, Lee County.

Alisma subcordatum
Ammania coccinea
Asclepias incarnata
Bacopa rotundifolia
Bidens cernua
Bidens tripartita
Bidens coronata
Boehmeria cylindrica
Boltonia asteroides
Carex lupuliformis
Carex scoparia
Carex stipata
Carex stricta
Carex tribuloides
Carex typhina
Carex vulpinoidea
Cephalanthus occidentalis
Cyperus erythrorhizos
Cyperus rivularis
Cyperus strigosus
Eclipta alba
Echinochloa walteri
Eleocharis acicularis
Eleocharis calva

Eleocharis obtusa
Eleocharis palustris
Eragrostis hypnoides
Erechtites hieracifolia
Galium tinctorium
Galium obtusum
Geum laciniatum
Gratiola virginiana
Hypericum mutilum
Impatiens capensis
Lemma minor
Lindernia dubia
Lippia lanceolata
Lobelia cardinalis
Lobelia siphilitica
Ludwigia alternifolia
Ludwigia palustris
Ludwigia polycarpa
Lycopus americanus
Mentha arvensis
Myriophyllum pinnatum
Nelumbo lutea
Peplis diandra
Penthorum sedoides

Pilea pumila
Polygonum lapathifolium
Polygonum pensylvanicum
Potamogeton foliosus
Ranunculus scleratus
Rorippa sessiliflora
Rorippa islandica
Sagittaria engelmanniana
Sagittaria graminea
Sagittaria latifolia

Sagittaria montevidensis
Sagittaria rigida
Salix nigra
Salix rigida
Scirpus atrovirens
Scirpus cyperinus
Sparganium americanum
Sparganium eurycarpum
Typha latifolia

12. Shallow ponds, ditches, sloughs, ox-bows along Cedar River and in shallow, intermittent ponds in fixed dunes of former glacial Lake Calvin shoreline, Muscatine County (species marked with an asterisk have not been collected in recent years and are probably now absent due to contamination and drainage of aquatic habitats).

Acorus calamus
Alisma subcordatum
Amorpha fruticosa
 **Armoracia aquatica*
Asclepias incarnata
Azolla mexicana
Bidens cernua
Boltonia asteroides
Brasenia schreberi
Callitriche heterophylla
Calamagrostis canadensis
Carex atherodes
Carex comosa
Carex lupulina
Cephalanthus occidentalis
Ceratophyllum demersum
Cicuta bulbifera
Cicuta maculata
Elodea nuttallii
Epilobium coloratum
Eragrostis hypnoides
Glyceria striata
Gratiola neglecta
Gratiola virginiana
Heteranthera dubia
Heteranthera limosa
Hibiscus militaris
Iris virginica
Leersia oryzoides
Lemna minor
Lemna trisulca
Lindernia dubia
Lippia lanceolata
Lobelia siphilitica
Ludwigia alternifolia
Ludwigia palustris
Ludwigia polycarpa
Lycopus americanus
Lycopus uniflorus
Lythrum alatum
Lysimachia ciliata
Lysimachia hybrida
Lysimachia quadriflora
Lysimachia terrestris
Mentha arvensis
Mimulus ringens
 **Myriophyllum exalbescens*
Nuphar luteum
Nymphaea tuberosa
Onoclea sensibilis

Penthorum sedoides
Phragmites communis
Phalaris arundinacea
Physostegia parviflora
Polygonum coccineum
Polygonum hydroppiper
Polygonum sagittatum
Pontederia cordata
 **Potamogeton amplifolius*
 **Potamogeton diversifolius*
 **Potamogeton epihydrus*
Potamogeton foliosus
 **Potamogeton illinoensis*
 **Potamogeton natans*
 **Potamogeton nodosus*
 **Potamogeton pectinatus*
 **Potamogeton zosteriformis*
Proserpinaca palustris
Ranunculus flabellaris
Ranunculus longirostris
Ranunculus scleratus
Rorippa islandica
Rotala ramosior
Rumex orbiculatus
Rumex verticillatus
Sagittaria graminea
Sagittaria latifolia
Sagittaria rigida
Scirpus atrovirens
Scirpus cyperinus
Scirpus fluviatilis
Scirpus validus
Scutellaria galericulata
Scutellaria lateriflora
Sparganium americanum
Sparganium eurycarpum
Spartina pectinata
Spirodela polyrrhiza
Stachys palustris
Stachys tenuifolia
Typha latifolia
 **Utricularia gibba*
Utricularia vulgaris
Vernonia fasciculata
Verbena hastata
Verbena urticifolia
Wolffia columbiana
Wolffia punctata
 **Zannichellia palustris*
Zizania aquatica

13. Lacustrine marshes in Oakland Township, Louisa County. Conesville Marsh furnishes perhaps the best example.

Alisma subcordatum
Amaranthus tuberculatus
Asclepias incarnata
Bidens cernua
Boehmeria cylindrica
Boltonia asteroides

Carex scoparia
Carex vulpinoidea
Ceratophyllum demersum
Cyperus erythrorhizos
Cyperus odoratus
Cyperus strigosus

<i>Echinochloa crusgalli</i>	<i>Onoclea sensibilis</i>
<i>Echinochloa walteri</i>	<i>Polygonum lapathifolium</i>
<i>Eleocharis acicularis</i>	<i>Polygonum pennsylvanicum</i>
<i>Eleocharis palustris</i>	<i>Polygonum punctatum</i>
<i>Elodea nuttallii</i>	<i>Polygonum sagittatum</i>
<i>Eragrostis hypnoides</i>	<i>Pontederia cordata</i>
<i>Eupatorium perfoliatum</i>	<i>Potamogeton foliosus</i>
<i>Glyceria septentrionalis</i>	<i>Potamogeton nodosus</i>
<i>Gratiola neglecta</i>	<i>Potamogeton pectinatus</i>
<i>Heteranthera dubia</i>	<i>Potamogeton vaseyi</i>
<i>Impatiens capensis</i>	<i>Ranunculus flabellaris</i>
<i>Lemma minor</i>	<i>Rorippa islandica</i>
<i>Lindernia dubia</i>	<i>Rorippa sessiliflora</i>
<i>Lobelia siphilitica</i>	<i>Sagittaria graminea</i>
<i>Ludwigia alternifolia</i>	<i>Sagittaria latifolia</i>
<i>Ludwigia polycarpa</i>	<i>Sagittaria rigida</i>
<i>Lycopus virginicus</i>	<i>Scirpus validus</i>
<i>Lysimachia hybrida</i>	<i>Sium suave</i>
<i>Mentha arvensis</i>	<i>Sparganium americanum</i>
<i>Mimulus ringens</i>	<i>Sparganium eurycarpum</i>
<i>Najas quadalupensis</i>	<i>Thelypteris palustris</i>
<i>Nuphar luteum</i>	<i>Wolffia columbiana</i>

14. Moist sandy margin of back-water pond adjacent to Mississippi River, near Moose Lodge, Muscatine Island, NE $\frac{1}{4}$ Sec. 4, T-75N, R-2W, Louisa County.

<i>Asclepias incarnata</i>	<i>Hypericum majus</i>
<i>Bidens cernua</i>	<i>Iris virginica</i>
<i>Bidens tripartita</i>	<i>Juncus acuminatus</i>
<i>Bidens vulgata</i>	<i>Leersia oryzoides</i>
<i>Cephalanthus occidentalis</i>	<i>Lippia lanceolata</i>
<i>Boltonia asteroides</i>	<i>Lycopus americanus</i>
<i>Cyperus erythrorhizos</i>	<i>Lysimachia hybrida</i>
<i>Cyperus odoratus</i>	<i>Rorippa islandica</i>
<i>Echinochloa crus-galli</i>	<i>Rotala ramosior</i>
<i>Eleocharis atropurpurea</i>	<i>Rumex maritimus</i>
<i>Eleocharis obtusa</i>	<i>Scirpus atrovirens</i>
<i>Eragrostis hypnoides</i>	<i>Scirpus cyperinus</i>
<i>Eragrostis pectinacea</i>	<i>Stachys tenuifolia</i>
<i>Hemicarpha micrantha</i>	<i>Typha latifolia</i>

15. Moist, sandy depressions, and wet, sandy margins of small ponds in commercial sand and gravel area, Spring Grove, T-69N, R-3W, Des Moines County.

<i>Amaranthus tuberculatus</i>	<i>Hypericum mutilum</i>
<i>Ammannia coccinea</i>	<i>Juncus torreyi</i>
<i>Asclepias incarnata</i>	<i>Lindernia dubia</i>
<i>Bidens cernua</i>	<i>Lippia lanceolata</i>
<i>Bidens polylepis</i>	<i>Lycopus americanus</i>
<i>Bidens tripartita</i>	<i>Lythrum alatum</i>
<i>Boltonia asteroides</i>	<i>Mimulus ringens</i>
<i>Carex cristatella</i>	<i>Penthorum sedoides</i>
<i>Carex scoparia</i>	<i>Polygonum hydrophyllum</i>
<i>Carex vulpinoidea</i>	<i>Polygonum pennsylvanicum</i>
<i>Cyperus inflexus</i>	<i>Ranunculus sceleratus</i>
<i>Cyperus odoratus</i>	<i>Rorippa islandica</i>
<i>Cyperus rivularis</i>	<i>Rorippa sessiliflora</i>
<i>Cyperus strigosus</i>	<i>Rotala ramosior</i>
<i>Eclipta alba</i>	<i>Rumex altissimus</i>
<i>Eleocharis obtusa</i>	<i>Scutellaria lateriflora</i>
<i>Eleocharis palustris</i>	<i>Salix interior</i>
<i>Fimbristylis autumnalis</i>	<i>Veronica peregrina</i>
<i>Gerardia purpurea</i>	

16. Boggy swales and wet, sphagnum woods, Cedar River region, in fixed dunes along former shoreline of glacial Lake Calvin, Muscatine County.

<i>Agrimonia parviflora</i>	<i>Campanula aparinoides</i>
<i>Aster lucidulus</i>	<i>Cardamine bulbosa</i>
<i>Aster novae-angliae</i>	<i>Chelone glabra</i>
<i>Aster umbellatus</i>	<i>Dulichium arundinaceum</i>
<i>Boehmeria cylindrica</i>	<i>Dryopteris cristata</i>
<i>Caltha palustris</i>	<i>Eupatorium maculatum</i>

Eupatorium perfoliatum
Equisetum pratense
Filipendula rubra
Fimbristylis autumnalis
Gentiana andrewsii
Gentiana crinita
Gerardia purpurea
Glyceria septentrionalis
Habenaria clavellata
Habenaria flava
Hypericum majus
Hypericum mutilum
Hypericum virginicum
Juncus acuminatus
Juncus canadensis
Juncus marginatus
Liparis loeselii
Ludwigia alternifolia
Ludwigia palustris
Ludwigia polycarpa
Onoclea sensibilis
Osmunda cinnamomea

Osmunda regalis
Parnassia glauca
Pedicularis lanceolata
Phlox maculata
Polygala cruciata
Polygala sanguinea
Ranunculus recurvatus
Rhexia virginica
Salix discolor
Saxifraga pensylvanica
Scleria triglomerata
Scirpus atrovirens
Solidago patula
Solidago riddellii
Spiraea alba
Symplocarpus foetidus
Viola lanceolata
Viola macloskeyi
Viola nephrophylla
Viola sagittata
Xyris torta

17. Alluvial, sandy flats along Cedar River, especially at Saulsbury Bridge and Bayfield, Muscatine County.

Androsace occidentalis
Anemone caroliniana
Arabis hirsuta
Arabis perstellata
Asclepias viridiflora
Aster linariifolius
Aster ptarmicoides
Aster sericeus
Camassia scilloides
Cardamine pensylvanica
Carex brevior
Carex festucacea
Carex gravida
Carex leavenworthii
Castilleja coccinea
Cerastium viscosum
Cerastium vulgatum
Clematis pitcheri
Corydalis micrantha
Delphinium virescens
Draba reptans
Ellisia nyctelea
Euphorbia dictyosperma
Geranium carolinianum
Hedeoma hispida
Hieracium longipilum

Hordeum pusillum
Houstonia minima
Lepidium densiflorum
Lithospermum incisum
Myosotis verna
Myosurus minimus
Oenothera laciniata
Opuntia humifusa
Panicum oligosanthos
Phlox bifida
Plantago aristata
Plantago purshii
Plantago virginica
Polamsia graveolens
Potentilla rivalis
Ranunculus abortivus
Rorippa sessiliflora
Rorippa sylvestris
Ruellia humilis
Scutellaria parvula
Selaginella rupestris
Sporobolus cryptandrus
Tradescantia bracteata
Triodanis perfoliata
Veronica peregrina
Wulfenia bullii

18. Prairie in sandy terrace soil near Ft. Madison, Secs. 12 and 13, T-67N, R-5W, Lee County.

Ambrosia psilostachya
Aristida tuberculosa
Artemisia caudata
Asclepias amplexicaulis
Cacalia atriplicifolia
Carex brevior
Carex muklenbergii
Cenchrus pauciflorus
Chamaecrista fasciculata
Chenopodium leptophyllum
Crotalaria sagittalis
Croton glandulosus
Cycloloma atriplicifolium
Cyperus filiculmis
Cyperus schweinitzii
Digitaria filiformis
Euphorbia corollata
Froelichia floridana
Helianthus petiolaris

Hordeum pusillum
Leptoloma cognatum
Lespedeza capitata
Lithospermum carolinense
Mollugo verticillata
Monarda punctata
Oenothera laciniata
Oenothera rhombipetala
Panicum implicatum
Paspalum ciliatifolium
Physalis heterophylla
Plantago purshii
Rumex acetosella
Sporobolus asper
Strophostyles helvola
Strophostyles leiosperma
Tribulus terrestris
Triodanis perfoliata
Verbena bracteata

19. Dry, sandy open places and extremely sandy prairie near Moose Lodge, Muscatine Island, NE $\frac{1}{4}$ Sec. 4, T-75N, R-2W, Louisa County.

<i>Agropyron smithii</i>	<i>Hordeum pusillum</i>
<i>Ambrosia psilostachya</i>	<i>Koeleria cristata</i>
<i>Aristida basiramea</i>	<i>Liatris aspera</i>
<i>Aristida oligantha</i>	<i>Leptoloma cognatum</i>
<i>Aristida tuberculosa</i>	<i>Linaria canadensis</i>
<i>Artemesia candata</i>	<i>Lithospermum carolinienise</i>
<i>Asclepias amplexicaulis</i>	<i>Mollugo verticillata</i>
<i>Baptisia leucophaea</i>	<i>Oenothera rhombipetala</i>
<i>Bouteloua hirsuta</i>	<i>Panicum implicatum</i>
<i>Calamovilfa longifolia</i>	<i>Panicum virgatum</i>
<i>Carex muhlenbergii</i>	<i>Paspalum ciliatifolium</i>
<i>Cenchrus pauciflorus</i>	<i>Penstemon grandiflorus</i>
<i>Chamaecrista fasciculata</i>	<i>Penstemon pallidus</i>
<i>Chenopodium leptophyllum</i>	<i>Plantago aristata</i>
<i>Clematis pitcheri</i>	<i>Plantago purshii</i>
<i>Comandra umbellata</i>	<i>Polanisia graveolens</i>
<i>Commelina erecta</i>	<i>Polygonum ramosissimum</i>
<i>Corydalis curvisiliqua</i>	<i>Polygonum tenue</i>
<i>Crotalaria sagittalis</i>	<i>Ptelea trifoliata</i>
<i>Croton glandulosus</i>	<i>Rhus aromatica</i>
<i>Cycloloma atriplicifolium</i>	<i>Rumex acetosella</i>
<i>Cyperus schweinitzii</i>	<i>Salix humilis</i>
<i>Elymus canadensis</i>	<i>Solidago missouriensis</i>
<i>Equisetum laevigatum</i>	<i>Solidago rigida</i>
<i>Eragrostis spectabilis</i>	<i>Sorghastrum nutans</i>
<i>Euphorbia corollata</i>	<i>Sporobolus cryptandrus</i>
<i>Euphorbia geyeri</i>	<i>Stipa spartea</i>
<i>Euphorbia hexagona</i>	<i>Strophostyles helvola</i>
<i>Festuca octoflora</i>	<i>Strophostyles leiosperma</i>
<i>Froelichia floridana</i>	<i>Tephrosia virginiana</i>
<i>Geranium carolinianum</i>	<i>Tradescantia ohioensis</i>
<i>Hedeoma hispida</i>	<i>Tridens flavus</i>
<i>Helianthus occidentalis</i>	<i>Triplasis purpurea</i>
<i>Helianthus petiolaris</i>	

20. Dry sandy soil of fixed dunes, often open woods, Cedar River region, along former shore-line of glacial Lake Calvin, Muscatine County.

<i>Ambrosia psilostachya</i>	<i>Helianthemum bicknellii</i>
<i>Aristida basiramea</i>	<i>Helianthus petiolaris</i>
<i>Artemisia caudata</i>	<i>Hieracium scabrum</i>
<i>Aster ericoides</i>	<i>Krigia biflora</i>
<i>Aster linariifolius</i>	<i>Lechea tenuifolia</i>
<i>Aster oblongifolius</i>	<i>Lechea stricta</i>
<i>Aster ptarmicoides</i>	<i>Leptoloma cognatum</i>
<i>Aster sericeus</i>	<i>Lithospermum carolinienise</i>
<i>Bouteloua curtipendula</i>	<i>Linum sulcatum</i>
<i>Bouteloua hirsuta</i>	<i>Monarda punctata</i>
<i>Cacalia atriplicifolia</i>	<i>Mollugo verticillata</i>
<i>Carex brevior</i>	<i>Oenothera rhombipetala</i>
<i>Carex festucacea</i>	<i>Onosmodium occidentale</i>
<i>Carex leavenworthii</i>	<i>Opuntia humifusa</i>
<i>Carex muhlenbergii</i>	<i>Panicum clandestinum</i>
<i>Carya alba</i>	<i>Panicum implicatum</i>
<i>Cenchrus pauciflorus</i>	<i>Panicum oligosanthes</i>
<i>Cirsium hillii</i>	<i>Paspalum ciliatifolium</i>
<i>Corydalis curvisiliqua</i>	<i>Physalis heterophylla</i>
<i>Cristatella jamesii</i>	<i>Polygala incarnata</i>
<i>Croton glandulosus</i>	<i>Polygala verticillata</i>
<i>Crotalaria sagittalis</i>	<i>Polygonum tenue</i>
<i>Cycloloma atriplicifolia</i>	<i>Ptelea trifoliata</i>
<i>Cyperus filiculmis</i>	<i>Quercus velutina</i>
<i>Cyperus schweinitzii</i>	<i>Rhus aromatica</i>
<i>Dasistoma macrophylla</i>	<i>Ruellia humilis</i>
<i>Equisetum kansanum</i>	<i>Rumex acetosella</i>
<i>Eragrostis spectabilis</i>	<i>Scrophularia lanceolata</i>
<i>Euphorbia geyeri</i>	<i>Spiranthes gracilis</i>
<i>Euphorbia glyptosperma</i>	<i>Strophostyles helvola</i>
<i>Euphorbia hexagona</i>	<i>Strophostyles leiosperma</i>
<i>Froelichia floridana</i>	<i>Tephrosia virginiana</i>
<i>Gerardia aspera</i>	<i>Triplasis purpurea</i>
<i>Gnaphalium obtusifolium</i>	<i>Viola pedata</i>
<i>Helianthemum canadense</i>	<i>Wulfsenia bullii</i>

21. Sandy prairie openings and dry, sandy, open woods, Cliffland area, NW $\frac{1}{4}$ Sec. 11, T-71N, R-13W, Wapello County.

Amelanchier arborea
Amorpha canescens
Andropogon gerardii
Andropogon scoparius
Aristida basiramea
Aristida oligantha
Asclepias quadrifolia
Aster laevis
Carex cephalophora
Carex communis
Carex complanata
Carex gravida
Carya ovata
Carya tomentosa
Ceanothus americanus
Cirsium discolor
Cornus racemosa
Crataegus margareta
Cyperus filiculmis
Eragrostis capillaris
Erigeron strigosus
Euphorbia corollata
Hedeoma hispida
Hypericum sphaerocarpum
Lechea tenuifolia
Lespedeza violacea

Lespedeza virginica
Liatris squarrosa
Mollugo verticellata
Myosotis verna
Ostrya virginiana
Panicum implicatum
Panicum linearifolium
Panicum oligosanthes
Paronychia canadensis
Paronychia fastigiata
Penstemon pallidus
Plantago aristata
Plantago virginica
Quercus alba
Quercus \times *bushii*
Quercus imbricaria
Quercus macrocarpa
Quercus rubra
Rhus aromatica
Rhus glabra
Rosa \times *rudiuscula*
Rubus flagellaris
Ruellia humilis
Rumex acetosella
Salix humilis
Silene stellata

22. Dry, exposed prairie-like crest, and sheltered ledges of limestone cliff adjacent to Reed Creek, approximately 1 mile east of Bonaparte, SE $\frac{1}{4}$ Sec. 8, T-68N, R-8W, Van Buren County.

a. Sheltered ledges:

Amelanchier arborea
Aquilegia canadensis
Cornus alternifolia
Cystopteris bulbifera
Physocarpus opulifolius
Ptelea trifoliata
Staphylea trifolia
Taxus canadensis
Viburnum molle
Viburnum rafinesquianum

Eupatorium altissimum
Gerardia grandiflora
Gerardia tenuifolia
Helianthemum bicknellii
Heliopsis helianthoides
Hypericum prolificum
Juniperus virginiana
Lechea tenuifolia
Lespedeza virginiana
Ostrya virginiana
Oxalis violacea
Polygala sanguinea
Ruellia humilis
Rhus aromatica
Rosa carolina
Rosa \times *rudiuscula*
Solidago nemoralis

b. Dry, prairie-like crest of bluff:

Amorpha canescens
Aristida dichotoma
Aristida longispica
Aristida oligantha
Aster laevis
Crotalaria sagittalis

23. Sandstone bluffs, sandstone boulder talus, and sandy talus on rounded slopes, Wildcat Den State Park, Muscatine County.

Acer saccharum
Amelanchier arborea
Amorpha canescens
Antennaria neglecta
Antennaria plantaginifolia
Apocynum androsaemifolium
Aquilegia canadensis
Arabis laevigata
Aralia nudicaulis
Aralia racemosa
Aruncus dioicus
Asclepias purpurascens
Asclepias quadrifolia
Athyrium thelypteroides
Aureolaria grandiflora
Calopogon pulchellus
Camptosorus rhizophyllus
Carex pennsylvanica
Carex communis
Carex shortiana
Carpinus caroliniana

Carya ovata
Carya tomentosa
Circaea alpina
Comandra umbellata
Cystopteris bulbifera
Danthonia spicata
Diervilla lonicera
Dodecatheon meadia
Dryopteris goldiana
Dryopteris spinulosa
Erigeron annuus
Euphorbia corollata
Fragaria vesca
Gaylussacia baccata
Glyceria striata
Goodyera pubescens
Habenaria bracteata
Helianthemum canadense
Hypoxis hirsuta
Impatiens pallida
Juncus tenuis

<i>Juniperus virginiana</i>	<i>Potentilla simplex</i>
<i>Krigia biflora</i>	<i>Prunus virginiana</i>
<i>Lechia tenuifolia</i>	<i>Pteridium aquilinum</i>
<i>Lycopodium complanatum</i>	<i>Pycnanthemum flexuosum</i>
<i>Maianthemum canadense</i>	<i>Quercus velutina</i>
<i>Mitella diphylla</i>	<i>Ranunculus jascicularis</i>
<i>Muhlenbergia sobolifera</i>	<i>Ribes cynosbati</i>
<i>Orchis spectabilis</i>	<i>Rubus flagellaris</i>
<i>Oxalis violacea</i>	<i>Sanicula canadensis</i>
<i>Panicum depauperatum</i>	<i>Senecio aureus</i>
<i>Panicum implicatum</i>	<i>Spiranthes gracilis</i>
<i>Panicum latifolium</i>	<i>Staphylea trifolia</i>
<i>Parietaria pensylvanica</i>	<i>Thelypteris phegopteris</i>
<i>Pedicularis canadensis</i>	<i>Triodanis perfoliata</i>
<i>Pinus strobus</i>	<i>Triosteum perfoliatum</i>
<i>Poa languida</i>	<i>Viola incognita</i>
<i>Polypodium vulgare</i>	<i>Viola pedata</i>
<i>Polystichum acrostichoides</i>	<i>Viola rugulosa</i>
<i>Populus grandidentata</i>	<i>Woodsia obtusa</i>
<i>Populus tremuloides</i>	

24. Common weeds of roadsides, railroads, and waste land.

<i>Abutilon theophrastii</i>	<i>Hibiscus trionum</i>
<i>Achillea millefolium</i>	<i>Hordeum jubatum</i>
<i>Agropyron repens</i>	<i>Lactuca scariola</i>
<i>Agrostia alba</i>	<i>Lepidium virginicum</i>
<i>Althaea rosea</i>	<i>Lychmis alba</i>
<i>Amaranthus albus</i>	<i>Malva neglecta</i>
<i>Amaranthus graecizans</i>	<i>Melilotus alba</i>
<i>Amaranthus retroflexus</i>	<i>Melilotus officinalis</i>
<i>Ambrosia artemisiifolia</i>	<i>Mirabilis nyctaginea</i>
<i>Ambrosia trifida</i>	<i>Morus alba</i>
<i>Anthemis cotula</i>	<i>Nepeta cataria</i>
<i>Asclepias syriaca</i>	<i>Panicum capillare</i>
<i>Aster pilosus</i>	<i>Pastinaca sativa</i>
<i>Barbarea vulgaris</i>	<i>Phleum pratense</i>
<i>Brassica kaber</i>	<i>Plantago rugelii</i>
<i>Brassica nigra</i>	<i>Poa compressa</i>
<i>Bromus inermis</i>	<i>Poa pratensis</i>
<i>Bromus japonicus</i>	<i>Polygonum aviculare</i>
<i>Bromus tectorum</i>	<i>Polygonum convolvulus</i>
<i>Capsella bursa-pastoris</i>	<i>Polygonum pensylvanicum</i>
<i>Cenchrus pauciflorus</i>	<i>Portulaca oleracea</i>
<i>Chamaecrista fasciculata</i>	<i>Rumex crispus</i>
<i>Chenopodium album</i>	<i>Sambucus canadensis</i>
<i>Cichorium intybus</i>	<i>Saponaria officinalis</i>
<i>Convolvulus sepium</i>	<i>Setaria lutescens</i>
<i>Digitaria ischaemum</i>	<i>Setaria viridis</i>
<i>Digitaria sanguinalis</i>	<i>Sida spinosa</i>
<i>Echinochloa crus-galli</i>	<i>Silene antirrhina</i>
<i>Eleusine indica</i>	<i>Sisymbrium officinale</i>
<i>Elymus canadensis</i>	<i>Solidago altissima</i>
<i>Elymus virginicus</i>	<i>Taraxacum officinale</i>
<i>Eragrostis ciliarensis</i>	<i>Tradescantia ohioensis</i>
<i>Erigeron strigosus</i>	<i>Verbascum thapsus</i>
<i>Euphorbia maculata</i>	<i>Veronica peregrina</i>
<i>Euphorbia supina</i>	

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