

VASCULAR PLANTS OF THE MANITO GRAVEL PRAIRIE TAZEWELL COUNTY, ILLINOIS

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ABSTRACT

The Manito Gravel Prairie in Tazewell County, Illinois is a 19.64 acre (7.94 ha.) preserve containing remnant gravel hill prairie and sand prairie as well as disturbed upland forest and successional fields. A total of 212 species of vascular plants representing 63 families were identified during a study conducted during the summer and fall of 1981 and spring of 1982. The only known Illinois population of Tennessee milk vetch (*Astragalus tennesseensis*) occurs in this preserve.

INTRODUCTION

The Manito Gravel Prairie (Shoop Prairie) is located about 6 miles southwest of Pekin in Tazewell County, Illinois (Section 15 and Section 22, T24N, R6W, 3PM). The prairie was evaluated by the Illinois Natural Areas Inventory in 1977 and identified as a site of state-wide significance (White, 1978). The Nature Conservancy acquired the tract in 1980 and transferred it to the Illinois Department of Conservation for dedication as a nature preserve. The Natural Land Institute assisted in its preservation.

The preserve is situated at the edge of a sand and gravel terrace in the Illinois River valley (Hunter, 1966). This terrace stretches from Pekin to Manito and forms 20 to 30 foot bluffs above the river floodplain. The Manito Gravel Prairie is within the Illinois River and Mississippi River Sand Areas Natural Division of Illinois (Schwegman, 1973).

Relatively undisturbed prairie vegetation occurs on approximately 8 acres (3.2 ha.) of the study site. This area had been used as a pasture but was never cultivated. The previous owners, the Shoop family, bought the farm in 1935. According to Henry Hintz, who farmed their land, they cultivated the level sandy upland (probably until the mid 1950's) but the land along the bluff was too steep and rough to plow. The entire tract was lightly grazed by horses and cattle until the early 1960's and was burned off nearly every spring until the late 1970's. Except

for the spring burns, the tract had been idle for nearly 20 years before it was acquired by the Department of Conservation.

METHODS

The preserve was visited 21 times during the study. Each time the entire tract was surveyed and the species noted along with habitat and relative abundance. Plants that could not be identified in the field were collected but no voucher specimens were made during this study. The site was visited once in May 1981, 4 times in June, 3 times in July, 3 times in August, twice in September and once in October. In 1982 it was visited 3 times in March, twice in April and twice in May. An effort was made to cover the entire preserve at each visit.

RESULTS AND DISCUSSION

Four major natural communities are present at the Manito Gravel Prairie preserve. (Figure 1.) These are gravel hill prairie, sand prairie, dry mesic upland forest and successional field (White, 1978). Gravel hill prairie occupies several west and southwest facing slopes at the edge of the bluff and two slopes above a ravine that dissects the bluff at the east end of the preserve. The dominant plants are *Andropogon scoparius* and *Bouteloua curtipendula*. Typical associates are *Echinacea pallida*, *Potentilla arguta*, *Amorpha canescens*, *Petalostemum purpureum*, *Oxalis violacea*, *Arenaria stricta*, *Lithospermum incisum* and *Dodecatheon meadia*. Also present in this community but much less common are *Sporobolus heterolepis*, *Muhlenbergia cuspidata*, *Anemone caroliniana* and *Wulfenia bullii*.

In a few places the soil is very thin over gravel or the gravel is on the surface. Here the vegetation is very sparse and an unusual plant community is found. *Andropogon scoparius*, *Bouteloua hirsuta* and, in places, *Sporobolus clandestinus* dominate. The typical forbs are *Draba reptans*, *Oxalis violacea*, *Arenaria stricta*, *Viola rafinesquii*, *Plantago virginica*, *Corydalis micrantha*, *Hedeoma hispida* and *Astragalus tennesseensis*. Some of these plants are very uncommon in central Illinois.

Sand prairie occupies the more level ground above and between the gravel hillsides. *Andropogon scoparius* is the dominant plant and characteristic forbs are *Callirhoe triangulata*, *Opuntia compressa*, *Phlox bifida*, *Ambrosia psilostachya*, *Heterotheca villosa* and *Tephrosia virginiana*.

Two ravines that cut through the bluff support dry-mesic upland forest vegetation. *Quercus rubra* dominates with some *Carya tomentosa*. Common understory plants are *Ribes missouriense*, *Parthenocissus quinquefolia*, *Smilax hispida*, *Eupatorium rugosum*, *Galium aparine*, *Leonurus cardiaca*, *Aquilegia canadensis* and *Alliaria officinalis*. This community has been disturbed by grazing and many of the typical woodland herbs are lacking. *Clematis pitcheri*, *Cuphea petiolata* and *Euphorbia heterophylla* are found where the woods is open and thin.

The successional field community occupies about half of the preserve. Many exotic species occur in these old fields and pastures. *Poa pratensis*, *Poa compressa*, *Tridens flavus* and *Leptoloma cognatum* are the dominant grasses. Some typical herbs are *Rumex acetosella*, *Fragaria virginiana*, *Ambrosia artemisiifolia*, *Medicago lupulina*, *Oxalis stricta*, *Croton glandulosus*, *Asclepias verticillata*, *Verbena stricta*, *Physalis heterophylla* and *Erigeron canadensis*. Saplings 3 to 4 feet high

(.9 to 1.2 m) of *Crataegus mollis*, *Gleditsia triacanthos* and *Prunus serotina* are abundant in the successional fields.

A total of 212 species of vascular plants representing 63 families were identified. Three species are ferns or fern allies, there is 1 gymnosperm species, 32 monocot species and 176 dicot species. The largest family represented is the Compositae with 30 species followed by the Poaceae with 23 species and the Leguminosae with 15 species.

Thirty-five of the species identified are alien, not native to central Illinois. This represents 16% of the species occurring at the preserve. The majority of the alien species occur in the dry sandy old fields and pastures or along the roadsides. In the least disturbed prairie only two alien species occur, *Poa pratensis* and *Rosa multiflora*.

One endangered species occurs in the preserve. *Astragalus tennesseensis* is listed as endangered in Illinois by Sheviak (1981). It is found in undisturbed gravel prairie. The prairie also provides habitat for two other species that are rare in Illinois, *Muhlenbergia cuspidata* and *Wulfenia bullii*.

The following annotated list (Table 1) follows the nomenclature of Mohlenbrock (1975). Following each species name is a brief note of its habitat and relative abundance (gp = gravel hill prairie, sp = sand prairie, uf = dry mesic upland forest, sf = successional field and rs = roadside; a = abundant, c = common, u = uncommon and r = rare). An asterisk (*) indicates the species is not native to Illinois according to Swink & Wilhelm (1979).

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Table 1. Vascular Plants of the Manito Gravel Prairie, Tazewell County, Illinois

| | |
|------------------------|--|
| EQUISETACEAE | <i>Equisetum laevigatum</i> A.Br.-rs; u |
| OPIHOGLOSSACEAE | <i>Botrychium virginianum</i> (L.) Sw.-rs;r |
| POLYPODIACEAE | <i>Asplenium platyneuron</i> (L.) Oakes rs;r |
| CUPRESSACEAE | <i>Juniperus virginiana</i> L.-rs; r |
| POACEAE | * <i>Bromus japonicus</i> Thunb.-sf;a * <i>Bromus inermis</i> Leys. -sf:u * <i>Poa pratensis</i> L.-sf;a * <i>Poa compressa</i> L.-sf:a * <i>Phleum pratense</i> L.-sf:r <i>Elymus virginicus</i> L.-uf,c <i>Elymus canadensis</i> L.-rs,u <i>Leptoloma cognatum</i> (Schult.) Chase.-sp,sf;a <i>Paspalum ciliatifolium</i> Michx. sf;c <i>Panicum oligosanthos</i> Schult. var. <i>scribnerianum</i> (Nash) Fern.-sp,sf;a * <i>Setaria viridis</i> (L.) Beauv.-sf;r <i>Sorghastrum nutans</i> (L.) Nash.-sp,sf;a <i>Andropogon gerardii</i> Vitman.-gp:r <i>Schizachyrium scoparium</i> (Michx.) Nash.-gp,sp,sf;a <i>Eragrostis trichodes</i> (Nutt.) Wood. sf:u <i>Tridens flavus</i> (L.) Hitchcock-sf:c <i>Muhlenbergia cuspidata</i> (Torr.) Rydb.-gp;u <i>Muhlenbergia schreberi</i> J.F. Gmel. uf;u <i>Sporobolus heterolepis</i> (Gray) Gray. gp;u <i>Sporobolus asper</i> (Michx.) Kunth. sp;u <i>Sporobolus clandestinus</i> (Biehler) Hitchc.-gp;c <i>Bouteloua curtipendula</i> (Michx.) Torr.-gp;a <i>Bouteloua hirsuta</i> Lag.-sp;c |
| CYPERACEAE | <i>Cyperus schweinitzii</i> Torr.-sp;u <i>Cyperus filiculmis</i> Vahl.-sp;u <i>Carex muhlenbergii</i> Sehk.-sp;u <i>Carex blanda</i> Dewey.-uf;c |
| COMMELINACEAE | <i>Tradescantia ohimensis</i> Raf.-sp,gp;c * <i>Commelina communis</i> L.-uf;c |
| LILIACEAE | <i>Erythronium albidum</i> Nutt.-rs,u * <i>Asparagus officinalis</i> L.-rs,sf;r |
| SMILACACEAE | <i>Smilax hispida</i> Muhl.-uf;c |
| SALICACEAE | <i>Salix interior</i> Rowlee.-rs;r |
| JUCLANDACEAE | <i>Juglans nigra</i> L.-rs,uf;u <i>Carya tomentosa</i> (Poir.) Nutt.-uf;c |
| FAGACEAE | <i>Quercus imbricaria</i> Michx.-uf,rs;c <i>Quercus rubra</i> L.-uf;a <i>Quercus macrocarpa</i> Michx.-uf;u |
| ULMACEAE | <i>Ulmus rubra</i> Muhl.-rs;u <i>Celtis occidentalis</i> L.-uf,rs;c |
| MORACEAE | <i>Morus rubra</i> L.-uf,rs;c * <i>Cornus sativa</i> L.-rs;r |
| POLYGONACEAE | * <i>Rumex acetosella</i> L.-sf;a * <i>Rumex crispus</i> L.-rs,uf;u * <i>Polygonum convolvulus</i> L.-rs;c <i>Polygonum tenue</i> Michx.-sp;r <i>Polygonum ramosissimum</i> Michx.-sf:u <i>Polygonum virginianum</i> L.-uf;r |
| CHENOPODIACEAE | <i>Chenopodium desiccatum</i> A.Nels sp;u <i>Chenopodium standleyanum</i> Aellen.-uf;u |
| AMARANTHACEAE | <i>Froelichia gracilis</i> (Hook.) Moq.-sf;c |
| NYCTAGINACEAE | <i>Mirabilis nyctaginea</i> (Michx.) MacM.-sp;c |
| PHYTOLACCACEAE | <i>Phytolacca americana</i> L.-rs;r |
| CARYOPHYLLACEAE | * <i>Holosteum umbellatum</i> L.-rs;c * <i>Cerastium vulgatum</i> L.-sf;c <i>Arenaria stricta</i> Michx.-gp;c * <i>Dianthus armeria</i> L.-rs,sf;r * <i>Lychnis alba</i> Mill.-rs;r <i>Silene stellata</i> (L.) Ait.f.-uf,gp;c <i>Silene antirrhina</i> L.-sp;c * <i>Saponaria officinalis</i> L.-rs;u |
| RANUNCULACEAE | <i>Ranunculus abortivus</i> L.-uf;c <i>Ranunculus fascicularis</i> Muhl.-gp;r <i>Anemone caroliniana</i> Walt.-gp;r <i>Anemone cylindrica</i> Gray.-gp,rs;c <i>Aquilegia canadensis</i> L.-uf;c <i>Clematis pitcheri</i> Torr. & Gray.-uf,rs;c |
| MENISPERMACEAE | <i>Menispermum canadense</i> L.-uf;c |
| PAPAVERACEAE | <i>Corydalis micrantha</i> (Engelm.) Gray. sp,gp;u |
| CRUCIFERAE | <i>Arabis glabra</i> (L.) Bernh.-rs;r <i>Arabis shortii</i> (Fern.) Gl.-uf;c <i>Descurainia pinnata</i> (Walt.) Britt. var. <i>brachycarpa</i> (Richards.) Fern.-sp;u <i>Draba reptans</i> (Lam.) Fern.-sp,sf;u <i>Lepidium virginicum</i> L.-sf;c * <i>Alliaria officinalis</i> Andr.-uf;a |
| SAXIFRAGACEAE | <i>Ribes missouriense</i> Nutt.-uf;c <i>Heuchera richardsonii</i> R.Br.-gp;u |
| PLATANACEAE | <i>Platanus occidentalis</i> L.-rs,u |
| ROSACEAE | <i>Prunus scrotina</i> Ehrh.-uf,rs,sf;c <i>Malus ioensis</i> (Wood) Britt.-rs;c <i>Crataegus mollis</i> (Torr. & Gray) Scheele. sf,rs;a <i>Rubus occidentalis</i> L.-rs,sf;u <i>Rubus flagellaris</i> Willd.-sf;r <i>Rubus allegheniensis</i> Porter-sf;u * <i>Rosa multiflora</i> Thunb.-gp,sf;r |

- Potentilla arguta* Pursh.-gp;c
Potentilla simplex Michx.-rs;u
 **Potentilla recta* L.-sf;c
Fragaria virginiana Duchesne.-sf,rs,gp;c
Geum canadense Jacq.-uf;c
LEGUMINOSAE
Gymnocladus dioica (L.)K Koch-rs;r
Gleditsia triacanthos L.-sf,rs;a
Amorpha fruticosa L.-rs;u
Amorpha canescens Pursh.-gp,sp;c
Psoralea onobrychis Nutt.-rs;r
Cassia fasciculata Michx.-sf,sp;c
Petalostemum purpureum (Vent.) Rydb.
 gp,sp;c
Tephrosia virginiana (L.) Pers.-sp;r
Astragalus tennesseensis Gray.-gp;u
 **Melilotus officinalis* (L.) Lam.-rs;r
 **Trifolium arvense* L.-sp;r
 **Medicago lupulina* L.-sf;a
 **Lespedeza stipulacea* Maxim.-sf;c
Lespedeza capitata Michx.-gp,sp;c
Desmodium illinoense Gray.-gp,sp;c
OXALIDACEAE
Oxalis violacea L.-gp;c
Oxalis dillenii Jacq.-sf,sp;c
GERANIACEAE
Ceranium carolinianum L.-sf;c
RUTACEAE
Xanthoxylum americanum Mill.-rs,uf;c
Pterea trifoliata L.-rs,uf;c
EUPHORBIACEAE
Croton glandulosus L. var.
septentrionalis Muell.-Arg.-sf;c
Acalypha rhomboidea Raf.-uf;c
Euphorbia corollata L.-sp,gp;c
Poinsettia cyanthophora (Murr.) Kl &
 Garcke.-uf;u
 **Poinsettia dentata* (Michx.) Kl & Gareke
 sf;c
Chamaesyce maculata (L.) Small.-sp,sf;u
ANACARDIACEAE
Toxicodendron radicans (L.) Kuntze.-uf,rs;c
Rhus glabra L.-rs;r
Rhus aromatica Ait.-sp,rs;a
CELASTRACEAE
Euonymus atropurpureus Jacq.-uf;u
HIPPOCASTANACEAE
Aesculus glabra Willd.-rs;r
RHAMNACEAE
Rhamnus lanceolata Pursh.-uf,rs;u
VITACEAE
Parthenocissus quinquefolia (L.) Planch.
 rs,uf;c
Vitis riparia Michx.-rs,uf,sf;c
MALVACEAE
Callirhoe triangulata (Leavenw.) Gray.
 sp;c
HYPERICACEAE
Hypericum sphaerocarpum Michx.-gp;c
VIOLACEAE
Viola sororia Willd.-uf;c
 **Viola rafinesquii* Greene.-sf,sp;c
CACTACEAE
Opuntia compressa (Salisb.) Macbr.-sp;c
LYTHRACEAE
Cuphea petiolata (L.) Koehne.-uf;u
ONAGRACEAE
Oenothera laciniata Hill.-rs;r
Oenothera biennis L.-sf,sp;c
Oenothera rhombipetala Nutt.-sf;r
Gaura biennis L.-sp,gp;c
UMBELLIFERAE
Sanicula canadensis L.-uf;u
Spermolepis incermis (Nutt.) Math. &
 Constance.-sp;u
CORNACEAE
Cornus drummondii C.A. Mey.-rs,uf,gp;a
PRIMULACEAE
Dodecatheon meadia L.-gp;u
Androsace occidentalis Pursh.-sf;u
OLEACEAE
Fraxinus americana L.-uf,rs;c
APOCYNACEAE
Apocynum cannabinum L.-uf;r
ASCLEPIADACEAE
Asclepias tuberosa L.-sp;u
Asclepias verticillata L.-sf,sp;a
Asclepias viridiflora Raf.-gp;r
Asclepias amplexicaulis Sm.-sp;r
Asclepias syriaca L.-sp;c
CONVOLVULACEAE
Ipomoea lacunosa L.-rs;u
POLEMONIACEAE
Phlox bifida Beck.-sp;c
HYDROPHYLLACEAE
Ellisia nyctelea L.-uf;c
BORAGINACEAE
Mertensia virginica (L.) Pers.-uf;c
Hackelia virginiana (L.) I.M. Johnston
 uf;u
Lithospermum incisum Lehm.-gp;u
Onosmodium hispidissimum Mack.-gp;c
VERBENACEAE
Verbena stricta Vent.-sf,sp;c
Verbena urticifolia L.-uf;u
LABIATAE
Isanthus brachiatus (L.) BSP-gp;c
Teucrium canadense L.-rs;u
Scutellaria parvula Michx.-gp;u
Hedeoma hispida Pursh.-gp;c
 **Nepeta cataria* L.-rs;u
 **Leonurus cardiaca* L.-rs,uf;c
SOLANACEAE
Solanum carolinense L.-sf;u
Solanum americanum Mill.-uf;u
Physalis heterophylla Nees.-sf,sp;c
SCROPHULARIACEAE
 **Veronica arcensis* L.-sf;u
Penstemon pallidus Small-gp;c
Scrophularia lanceolata Pursh.-rs,gp;u
 **Verbascum thapsus* L.-sp;u
Wulfenia hüllii (Eat.) Barnh.-gp;r
ACANTHACEAE
Ruellia humilis Nutt.-gp;c
PLANTAGINACEAE
Plantago aristata Michx.-sf;c
Plantago virginica L.-sp;c
Plantago rugelii Dene.-uf;c
RUBIACEAE
Galium pilosum Ait.-uf,gp;u
Galium aparine L.-uf;c

CUCURBITACEAE

Sicyos angulatus L.-rs;r

CAMPANULACEAE

Specularia perfoliata (L.) A. DC.-sf;c*Campanula americana* L.-uf;c

COMPOSITAE

Ambrosia trifida L.-rs;u*Ambrosia psilostachya* DC.-sf,sp;a*Ambrosia artemisiifolia* L.-sf;c*Rudbeckia hirta* L.-gp, sp;u*Echinacea pallida* (Nutt.) Nutt.-gp;c**Helianthus petiolaris* Nutt.-rs;r*Helianthus tuberosus* L.-rs;r*Bidens bipinnata* L.-uf;u*Heterotheca villosa* (Pursh) Shinners.-sp;c*Solidago juncea* Ait-sp;r*Solidago canadensis* L.-sp,rs;c*Aster pilosus* Willd.-sf,sp;c*Aster ericoides* L.-gp;u*Aster simplex* Willd.-rs;r*Erigeron strigosus* Muhl.-gp;c*Erigeron canadensis* L.-sf;c*Achillea millefolium* L.-sf,rs,sp;c*Antennaria neglecta* Greene.-sp,sf;c*Gnaphalium obtusifolium* L.-sf;u*Erechtites hieracifolia* (L.) Raf.-gp;r*Senecio plattensis* Nutt.-gp;c*Eupatorium rugosum* Houtt.-uf;a*Eupatorium altissimum* L.-gp,sp;c*Brickellia eupatorioides* (L.) Shinners.-gp;c**Arctium minus* (Hill) Bernh.-uf;r*Cirsium discolor* (Muhl.) Spreng.-sf;r**Tragopogon dubius* Scop.-rs,sf;r**Taraxacum officinale* Weber.-sf;r*Lactuca canadensis* L.-sp, sf;u**Lactuca serriola* L.-sf,rs;u