UPs23

Southern Mesic Prairie

Grass-dominated but forb-rich herbaceous communities on somewhat poorly drained to well-drained loam soils mainly formed in unsorted glacial till, sometimes in a thin loess layer over till, and locally in lacustrine sediments and outwash deposits. Communities in this class occur primarily on level to gently rolling sites. Drought stress is irregular in occurrence and usually not severe.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 102 plots (relevés).

• Graminoid cover is usually continuous (75 - 100%).Tallgrasses dominate. but several midheight grasses are also important. Species composition is fairly uniform. although relative abundances shift across the moisture gradient within the community. Big bluestem (Andropogon gerardii) and Indian grass (Sorghastrum nutans) are the dominant tallgrasses, with prairie dropseed (Sporobolus heterolepis) either a codominant or subdominant component. On the drier end of the gradient, little bluestem (Schizachyrium scoparium), porcupine arass (Stipa spartea), and side-oats grama (Bouteloua curtipendula) are important. On moister sites, switchgrass (Panicum virgatum) may



be common, and prairie cordgrass (Spartina pectinata) is usually present. Leiberg's panic grass (Panicum leibergii) is distinctive, although usually minor in terms of cover. • Forb cover is sparse to patchy (5–50%). Forb species composition also responds to moisture. A number of species are common across the moisture gradient, including heart-leaved alexanders (Zizia aptera), heath aster (Aster ericoides), stiff and Canada goldenrods (Solidago rigida and S. canadensis), purple and white prairie clovers (Dalea purpurea and D. candida), silverleaf scurfpea (Pediomelum argophyllum), stiff sunflower (Helianthus pauciflorus), white sage (Artemisia ludoviciana), northern bedstraw (Galium boreale), and smooth blue aster (Aster laevis). Maximilian's sunflower (Helianthus maximiliani), tall meadow-rue (Thalictrum dasycarpum), prairie phlox (Phlox pilosa), and gray-headed coneflower (Ratibida pinnata) are most common on the moister end of the gradient. Rough blazing star (Liatris aspera), Missouri and gray goldenrods (Solidago missouriensis and S. nemoralis), and bird's foot coreopsis (Coreopsis palmata) are common in the drier end. Rattlesnake master (Eryngium yuccifolium) and compass plant (Silphium laciniatum) are typical species in southeastern Minnesota but rare to absent in the community elsewhere. Narrow-leaved purple coneflower (Echinacea pallida) is common in the drier end of the gradient in the CGP but absent from the Eastern Broadleaf Forest Province.

• Shrub layer is sparse (5–25% cover). The low semi-shrubs leadplant (*Amorpha canescens*) and prairie rose (*Rosa arkansana*) are generally common. Sparse patches of wolfberry (*Symphoricarpos occidentalis*) are occasional. Gray dogwood (*Cornus racemosa*), American hazelnut (*Corylus americana*), and wild plum (*Prunus americana*) are rare.

• Trees are absent except where fire suppression has allowed invasion by woody species.

• Notes: Kentucky bluegrass (*Poa pratensis*), an introduced species, is invariably present; it increases in the prolonged absence of fire but becomes dominant only with heavy grazing pressure. Smooth brome (*Bromus inermis*), another exotic, is a very troublesome invasive species favored by disturbance, including natural disturbance by pocket gophers.



Landscape Setting & Soils

The region of Minnesota in which UPs23 occurs is predominantly a low-relief landscape interrupted by local areas of greater relief associated with stagnation moraines and large erosional features created by glacial meltwaters. The deeply dissected PPL in the southeast corner of the state, where UPs23 is rare, is exceptional. Historically in the PPL, UPs23 was confined to the tops of broader interfluves. UPs23 typically occupies ground moraines and end moraines and smaller inclusions of outwash and lacustrine sediments. In southwestern and southeastern Minnesota, outside the boundaries of the Wisconsin glacial deposits, UPs23 occurs on older, loess-mantled ground moraines. Soils are somewhat poorly drained to well drained, mostly moderately permeable to permeable, fine- and medium-textured loams and loamy sands. Soils are mollisols, characterized by thick, dark, organic-enriched upper horizons with high base saturation and dominantly bivalent cations.

Natural History

UPs23 is present on level to gently sloping sites where the water table is below the rooting zone except for brief periods during the growing season. Soil moisture availability remains high on average because of soil texture and composition. Recurrent fire is essential for the existence of UPs23, as environmental conditions are otherwise suitable for the growth of trees: where propagules are available, succession to forest occurs rapidly in the absence of fire. Fires also recycle nutrients bound up in litter and promote flowering and seed production. These events temporarily expose the soil surface and so probably play an important role in plant regeneration. Before Euro-American settlement, grazing and trampling by large ungulates were regular occurrences in UPs23. The contribution of this disturbance to the composition and structure of the vegetation is not well understood, although it is known that confined grazing by domestic livestock can quickly destroy mesic prairies, promoting the replacement of most native species by introduced ones. Episodic grazing probably enables the persistence of some native species that cannot otherwise reproduce in the dense canopy of tall grasses and forbs characteristic of UPs23; these would include shorter species and especially annual or biennial species. Spatial patchiness in grazing intensity is also thought to have influenced fire behavior, providing a shifting patchwork of refugia for fire-sensitive animal species. The fertile soils and gentle relief of UPs23 are ideal for row-crop agriculture, and almost all of the land that supported this class has been converted to cropland.

Similar Native Plant Community Classes

UPn23 Northern Mesic Prairie

UPn23 differs from UPs23 mainly in the rarity or absence of several species typically present in UPs23, although none is present throughout the range of UPs23. Shrubs become increasingly important northward in UPn23. Tufted hairgrass (*Deschampsia cespitosa*), absent from UPs23, is present in UPn23, although limited to wet-mesic occurrences. The boundary between these two classes is set more or less by convention; further study may determine that it should be repositioned or abandoned. Because of differences between the predominant glacial landforms in the ranges of the two classes, wet-mesic prairies are more common in UPn23 and dry-mesic prairies in species frequency and cover between these two classes.

11Do22 Indicator Spacios	(fre	q%)	11Dn22 Indicator Spacing	(free	q%)
OPS25 Indicator Species	UPs23	UPn23	OPH25 Indicator Species	UPs23	UPn23
Gray-headed coneflower (Ratibida pinnata)	36	-	Tufted hair grass (Deschampsia cespitosa)	-	35
Bird's foot coreopsis (Coreopsis palmata)	30	-	Harebell (Campanula rotundifolia)	2	48
Skyblue aster (Aster oolentangiensis)	18	-	Bebb's willow (Salix bebbiana)	2	24
Clammy ground cherry (Physalis heterophylla)	14	-	Glaucous false dandelion (Agoseris glauca)	2	24
Bicknell's sedge (Carex bicknellii)	11	-	-	-	-
Round-headed bush clover (Lespedeza capitata)	10	-	-	-	-
Canada tick trefoil (Desmodium canadense)	17	1	-	-	-
Aromatic aster (Aster oblongifolius)	10	2	-	-	-



UPs24 Southern Mesic Savanna

Scarcity of data for UPs24 makes comparison with UPs23 speculative. The herbaceous component of the two classes is probably similar, although forbs possibly are more important relative to graminoids in UPs24 than in UPs23. UPs24 is distinguished by the presence of at least sparse (> 10%) tree cover, dominated by bur oak.

• UPs13 Southern Dry Prairie

The greater importance of midheight grasses relative to tallgrass species in UPs13 results in generally lower canopy height in UPs13 than in UPs23. UPs13 typically has sparser vegetation cover, with some bare soil exposed, often with terricolous lichens, while the soil surface is completely hidden in UPs23. There is little difference in species composition between drier examples of UPs23 and occurrences of UPs13 on loamier soils. Topography, soil characteristics, and relative abundances of species characteristic of dry versus mesic habitats provide the basis for determination.

11Do22 Indicator Spanica	(fre	q%)	UDe12 Indicator Species	(free	q%)
OPS25 Indicator Species	UPs23	UPs13	OPSIS Indicator Species	UPs23	UPs13
Prairie cordgrass (Spartina pectinata)	30	-	Hairy grama (Bouteloua hirsuta)	-	30
American vetch (Vicia americana)	23	1	Dotted blazing star (Liatris punctata)	1	34
Ox-eye (Heliopsis helianthoides)	31	2	Sage wormwood (Artemisia frigida)	1	23
Tall meadow-rue (Thalictrum dasycarpum)	44	5	Flowering spurge (Euphorbia corollata)	1	22
Maximilian's sunflower (Helianthus maximiliani)	31	4	Harebell (Campanula rotundifolia)	2	25
Switchgrass (Panicum virgatum)	44	8	Western ragweed (Ambrosia psilostachya)	4	26
Silverleaf scurfpea (Pediomelum argophyllum)	43	12	Plains muhly (Muhlenbergia cuspidata)	11	56
Leiberg's panic grass (Panicum leibergii)	43	16	Hoary vervain (Verbena stricta)	5	23

WPs54 Southern Wet Prairie

WPs54 grades into UPs23 at the moist end of the moisture gradient in UPs23, without a distinct floristic boundary between the two classes. WPs54 is always present on level or slightly concave sites except in the unusual situation where groundwater seepage creates moist habitat. Prairie cordgrass is typically much more important in WPs54 than in UPs23, as are sedges (*Carex* spp.). Big bluestem is typically present, although its contribution to total cover is usually less than in UPs23, and it may be absent. Leadplant is present in most instances of UPs23 and rarely present in WPs54.

UD-00 Indiantes Onesian	(fre	q%)	WD+FA Indiantes Onesian	(fre	q%)
UPS23 Indicator Species	UPs23	WPs54	WPS54 Indicator Species	UPs23	WPs54
Stiff sunflower (Helianthus pauciflorus)	50	-	Bluejoint (Calamagrostis canadensis)	1	25
White sage (Artemisia ludoviciana)	43	-	Spotted water hemlock (Cicuta maculata)	2	35
Porcupine grass (Stipa spartea)	58	2	Autumn sneezeweed (Helenium autumnale)	3	37
Leiberg's panic grass (Panicum leibergii)	43	2	Prairie loosestrife (Lysimachia quadriflora)	4	33
Leadplant (Amorpha canescens)	74	6	Riddell's goldenrod (Solidago riddellii)	6	41
Missouri goldenrod (Solidago missouriensis)	47	4	Golden or False golden ragwort*	9	43
Rough blazing star (Liatris aspera)	59	6	Stemless blue violets**	9	41
White prairie clover (Dalea candida)	55	8	Woolly sedge (Carex pellita)	9	41
*Coldon or Foloo goldon request (Sonooio ourous)	or C poou	dourouol	**Ctomlage blue vielete (Viele nephrophylle and sig	ailor Violo	000)

Golden or False golden ragwort (Senecio aureus or S.pseudaureus) **Stemless blue violets (Viola nephrophylla and similar Viola spp.)

Native Plant Community Types in Class

• UPs23a Mesic Prairie (Southern)

UPs23a is the only community type recognized in this class. Additional data and further analysis may warrant subdivision based on soils (sands versus loams) and differences in moisture regime (dry-mesic versus wet-mesic).







Schaefer Prairie, McLeod County, MN

Cover
∞ŏ
Frequency
- Species
Prairie
Mesic
Southern
UPs23

	treq%	cover		treq%	cover
^c orbs, Ferns & Fern Allies			White camas (Zigadenus elegans)	27	•
Heart-leaved alexanders (Zizia aptera)	78	٠	Common strawberry (Fragaria virginiana)	26	•
Heath aster (Aster ericoides)	77	:	Bastard toadflax (Comandra umbellata)	25	•
Stiff goldenrod (Solidago rigida)	74	•	Virginia mountain mint (Pycnanthemum virginianum)	25	•
Canada goldenrod (Solidago canadensis)	69	:	Pale-spiked lobelia (Lobelia spicata)	25	٠
Purple prairie clover (Dalea purpurea)	68	•	American vetch (Vicia americana)	23	•
Yarrow (Achillea millefolium)	65	•	Ground plum (Astragalus crassicarpus)	23	٠
Rough blazing star (Liatris aspera)	59	•	Canada anemone (Anemone canadensis)	22	•
Prairie phlox (Phlox pilosa)	55	•	Clasping dogbane (Apocynum sibiricum)	22	•
White prairie clover (Dalea candida)	55	٠	Virginia ground cherry (Physalis virginiana)	22	•
Hoary puccoon (Lithospermum canescens)	53	•	Toothed evening primrose (Calylophus serrulatus)	21	•
Stiff sunflower (Helianthus pauciflorus)	50	٠	Wood betony (Pedicularis canadensis)	20	•
Prairie wild onion (Allium stellatum)	49	•	Northern plains blazing star (Liatris ligulistylis)	20	٠
Missouri goldenrod (Solidago missouriensis)	47	:	Wild bergamot (Monarda fistulosa)	19	•
Long-headed thimbleweed (Anemone cylindrica)	46	•	Skyblue aster (Aster oolentangiensis)	18	:
Bearded birdfoot violet (Viola palmata)	45	•	Canada tick trefoil (Desmodium canadense)	17	•
Flodman's thistle (Cirsium flodmanii)	45	•	Smooth rattlesnakeroot (Prenanthes racemosa)	15	•
Tall meadow-rue (Thalictrum dasycarpum)	44	٠	Wood lily (Lilium philadelphicum)	13	•
Daisy fleabane (Erigeron strigosus)	44	•	Rattlesnake master (Eryngium yuccifolium)	12	٠
Silverteaf scurtpea (Pediomelum argophyllum)	43	٠	Grasses & Sedges		
White sage (Artemisia ludoviciana)	43	•	Big bluestem (Andropogon gerardii)	94	i
Northern bedstraw (Galium boreale)	39	:	Indian grass (Sorghastrum nutans)	80	:
Smooth blue aster (Aster laevis)	37	•	Little bluestem (Schizachyrium scoparium)	67	i
Gray-headed coneflower (Ratibida pinnata)	36	:	Prairie dropseed (Sporobolus heterolepis)	66	:
Silky aster (Aster sericeus)	34	•	Porcupine grass (Stipa spartea)	58	:
Maximilian's sunflower (Helianthus maximiliani)	31	:	Side-oats grama (Bouteloua curtipendula)	46	:
Gray goldenrod (Solidago nemoralis)	31	:	Switchgrass (Panicum virgatum)	44	:
Ox-eye (Heliopsis helianthoides)	31	•	Leiberg's panic grass (Panicum leibergii)	43	:
Tall cinquefoil (Potentilla arguta)	31	•	Slender wheatgrass (Elymus trachycaulus)	32	•
Common milkweed (Asclepias syriaca)	31	٠	Prairie cordgrass (Spartina pectinata)	30	:
Bird's foot coreopsis (Coreopsis palmata)	30	:	Semi-Shrubs		
Narrow-leaved purple coneflower (Echinacea pallida)	30	•	Leadplant (Amorpha canescens)	74	:
Prairie turnip (Pediomelum esculentum)	30	•	Prairie rose (Rosa arkansana)	70	•
Alumroot (Heuchera richardsonii)	28	•	Shrubs		
Great blazing star (Liatris pycnostachya)	27	:	Wolfberry (Symphoricarpos occidentalis)	17	:



