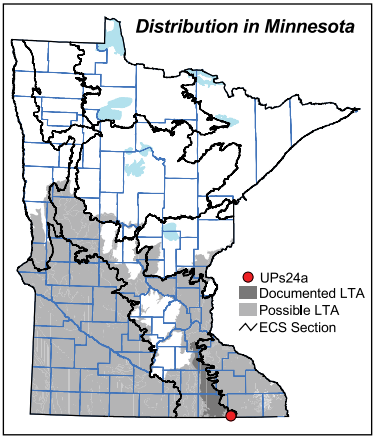
Southern Mesic Savanna

Sparsely treed communities with tallgrass-dominated ground layers 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. Present primarily on level to gently rolling sites. Drought stress is irregular in occurrence and usually not severe.

Vegetation Structure & Composition

There is only one vegetation plot for this class; description is based mainly on inference from Southern Mesic Prairie (UPs23) and Southern Dry Savanna (UPs14).



- **Graminoid** cover is interrupted to continuous (50–100%). Tallgrasses dominate, but several midheight grasses are also important. 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 moisture gradient, little bluestem *(Schizachyrium scoparium)*, porcupine grass *(Stipa spartea)*, and side-oats grama *(Bouteloua curtipendula)* are important.
- **Forb** cover is sparse to patchy (5–50%). The most common species are 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 common in moister examples; rough blazing star *(Liatris aspera)*, Missouri and gray goldenrods *(Solidago missouriensis* and *S. nemoralis)*, and bird's foot coreopsis *(Coreopsis palmata)* are common in drier ones.
- **Woody vines** are a minor component. Virginia creeper *(Parthenocissus* spp.) is frequently present, and wild grape *(Vitis riparia)* is occasionally present.
- **Shrub layer** is patchy to interrupted (50–75% cover) and composed of low (< 20in [50cm]) semi-shrubs, taller (up to 6ft [2m]) shrubs, and oak seedlings and saplings (< 6ft). The low semi-shrubs leadplant *(Amorpha canescens)*, prairie rose *(Rosa arkansana)*, and poison ivy *(Toxicodendron rydbergii)* are generally common. Common taller shrubs are chokecherry *(Prunus virginiana)*, American hazelnut *(Corylus americana)*, smooth sumac *(Rhus glabra)*, gray dogwood *(Cornus racemosa)*, wolfberry *(Symphoricarpos occidentalis)*, low juneberry *(Amelanchier humilis)*, and wild plum *(Prunus americana)*.
- **Trees** are scattered or in scattered clumps, with total cover < 70% and typically 25–50%. Bur oak is most common, but northern pin oak is also usually present.
- **Notes**: The exotic grasses Kentucky bluegrass *(Poa pratensis)* and smooth brome *(Bromus inermis)* are often problematic in UPs24. Pennsylvania sedge *(Carex pensylvanica* var. *pensylvanica),* a native graminoid that is naturally a minor component of UPs24, increases in abundance with prolonged heavy grazing. With fire suppression, trees other than the oaks become established, especially green ash, quaking aspen, and basswood.

Landscape Setting & Soils

Historically, UPs24 occurred most commonly in low relief prairie landscapes on ground moraines and end moraines, and less commonly on lacustrine deposits and finer-textured outwash. In the Rochester Plateau Subsection of the PPL, UPs24 occurred on loess-mantled pre-Wisconsin till. Soils are somewhat poorly drained to well drained, mostly moderately permeable to permeable, fine- and medium-textured loams and loamy sands. These are mollisols, characterized by thick, dark, organic-enriched upper horizons with high base saturation and dominantly bivalent cations.

Natural History

Savannas form where fire recurs frequently enough to prevent trees and shrubs from dominating, but where frequency and severity are low enough to allow fire-tolerant trees to become established and sometimes reach maturity. Historically, savannas occurred in physical proximity to prairies, but where features such as streams, lakes, and steep topography impeded the spread of fires, providing local amelioration of the prairie fire regime. All savannas are highly sensitive to fire suppression, quickly succeeding to woodland and eventually to forest, and the higher productivity of sites where UPs24 occurs makes it even more susceptible to succession than UPs14. UPs24 occupies sites where soil moisture availability remains high on average because of soil texture and composition, although the water table is below the rooting zone during the growing season except for brief periods. Before Euro-American settlement, grazing, browsing, and trampling by large ungulates were probably regular occurrences in UPs24. The contribution of this disturbance to the composition and structure of the vegetation is poorly understood, although confined grazing by domestic livestock can quickly destroy mesic savannas, promoting replacement of most of the native species by introduced ones. The fertile soils and gentle relief of UPs24 are ideal for row-crop agriculture, and almost all of the land that supported UPs24 has been converted to cropland; areas not converted have either been so heavily pastured that almost none of the native herbaceous flora survives, or they have become woodland or forest with fire suppression.

Similar Native Plant Community Classes

- **UPn24 Northern Mesic Savanna**

The scarcity of plot data for UPn24 and UPs24 make comparison of these classes speculative. Differences in the herbaceous flora probably mirror differences between UPs23 and UPn23. The two differ in tree composition, with northern pin oak frequent in UPs24 but rare in UPn24, and white oak occasional in UPs24 but not present in UPn24. Quaking aspen is probably more frequent in UPn24 than in UPs24. The boundary between these two classes, like that between UPs23 and UPn23, is set more or less by convention and could be repositioned or abandoned on further study.

- **UPs23 Southern Mesic Prairie**

UPs23 has similar herbaceous composition to UPs24—although forbs may be more important relative to graminoids in UPs24 than in UPs23—but generally lacks trees, while UPs24 has at least sparse (> 10%) tree cover, dominated by bur oak. Because of partial shading in UPs24, cool-season graminoids such as junegrass *(Koeleria pyramidata)*, porcupine grass, green needle grass *(Stipa viridula)*, and Pennsylvania sedge may be more important relative to warm-season grasses than in UPs23.

- **UPs14 Southern Dry Savanna**

Differences in the herbaceous flora between UPs14 and UPs24 are probably similar to the differences between UPs13 and UPs23. Shrub cover is probably greater in UPs24 than in UPs14—UPs24 might have more the appearance of a shrub thicket than that of a tree-studded prairie. Differences in substrate characteristics (predominantly sandy or gravelly outwash and lacustrine deposits versus predominantly loamy till) are sufficient in most cases to distinguish the two classes; classification uncertainty is likely only when UPs14 is on loamy slopes (UPs14c).

Native Plant Community Types in Class

- **UPs24a Mesic Oak Savanna (Southern)**

UPs24a is the only community type recognized in this class. Additional data and further analysis may warrant subdivision based on soils (sands versus loams).

photo by D.S. Wovcha, MN DNR

Fillmore County, MN