

**APPENDIX D: UPLAND AND WETLAND NATURAL COMMUNITIES
OCCURRING IN THE SOUTHWEST SAVANNA**

*Arranged by the level of opportunity to sustain and manage the natural community type
in the SW Savanna Ecological Landscape.*

Major Opportunity

Dry Prairie

This grassland community occurs on dry, often loess-derived soils, usually on steep south or west facing slopes or at the summits of river bluffs with sandstone or dolomite near the surface. Short to medium-sized prairie grasses: little bluestem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), and prairie dropseed (*Sporobolus heterolepis*), are the dominants in this community. Common shrubs and forbs include lead plant (*Amorpha canescens*), silky aster (*Aster sericeus*), flowering spurge (*Euphorbia corollata*), purple prairie-clover (*Petalostemum purpureum*), cylindrical blazing-star (*Liatris cylindracea*), and gray goldenrod (*Solidago nemoralis*). Stands on gravelly knolls in the Kettle Moraine region of southeastern Wisconsin and along the St. Croix River on the Minnesota – Wisconsin border may warrant recognition, at least at the subtype level.

Dry-Mesic Prairie

This grassland community occurs on slightly less droughty sites than Dry Prairie and has many of the same grasses, but taller species such as big bluestem (*Andropogon gerardii*) and Indian-grass (*Sorghastrum nutans*) dominate. Needle grass (*Stipa spartea*) may also be present. The herb component is more diverse than in Dry Prairies, including many species that occur in both Dry and Mesic Prairies.

Mesic Prairie

This grassland community occurs on rich, moist, well-drained sites. The dominant plant is the tall grass, big bluestem (*Andropogon gerardii*). The grasses little bluestem (*Andropogon scoparius*), indian grass (*Sorghastrum nutans*), porcupine grass (*Stipa spartea*), prairie dropseed (*Sporobolus heterolepis*), and tall switchgrass (*Panicum virgatum*) are also frequent. The forb layer is diverse in the number, size, and physiognomy of the species. Common taxa include the prairie docks (*Silphium spp.*), lead plant (*Amorpha canescens*), heath and smooth asters (*Aster ericoides* and *A. laevis*), sand coreopsis (*Coreopsis palmata*), prairie sunflower (*Helianthus laetiflorus*), rattlesnake-master (*Eryngium yuccifolium*), flowering spurge (*Euphorbia corollata*), beebalm (*Monarda fistulosa*), prairie coneflower (*Ratibida pinnata*), and spiderwort (*Tradescantia ohioensis*).

Oak Opening

As defined by Curtis, this is an oak-dominated savanna community in which there is less than 50% tree canopy. Historically, oak openings occurred on wet-mesic to dry sites. The few extant remnants are mostly on drier sites, with the mesic and wet-mesic openings almost totally destroyed by conversion to agricultural or residential uses, and by the encroachment of other woody plants due to fire suppression. Bur, white, and black oaks (*Quercus macrocarpa*, *Q. alba* and *Q. velutina*) are dominant in mature stands as large, open-grown trees with distinctive limb architecture. Shagbark hickory (*Carya ovata*) is sometimes present. American hazelnut (*Corylus americana*) is a common shrub, and while the herb layer is similar to those found in oak forests and prairies, with many of the same grasses and forbs present, there are some plants and animals that reach their optimal abundance in the “openings”.

Oak Woodland

This “forest” community is structurally intermediate between Oak Openings and Southern Dry Forest. The tree canopy cover is high, but frequent low-intensity fires and possibly (in pre-settlement times) browsing by herbivores such as elk, bison, and deer kept the understory relatively free of shrubs and saplings. Much additional information is needed but it appears that at least some plants (certain legumes, grasses, and composites among them) reached their highest abundance here.



Important Opportunity

Pine Relict

These isolated stands of white pine (*Pinus strobus*) and red pine (*P. resinosa*) or, less commonly, jack pine (*P. banksiana*), that occur on sandstone outcrops or in thin soils over sandstone in the Driftless Area of southwestern Wisconsin, have historically been referred to as relicts. The understories often contain species with northern affinities such as blueberries (*Vaccinium* spp.), huckleberry (*Gaylussacia baccata*), wintergreen (*Gaultheria procumbens*), pipsissewa (*Chimaphila umbellata*), and partridge-berry (*Mitchella repens*), sometimes mixed with herbs typically found in southern Wisconsin's oak forests and prairies.

Southern Dry Forest

Oaks are the dominant species in this upland forest community of dry sites. White oak (*Quercus alba*) and black oak (*Quercus velutina*) are dominant, often with admixtures of red and bur oaks (*Q. rubra* and *Q. macrocarpa*) and black cherry (*Prunus serotina*). In the well developed shrub layer, brambles (*Rubus* spp.), gray dogwood (*Cornus racemosa*), and American hazelnut (*Corylus americana*) are common. Frequent herbaceous species are wild geranium (*Geranium maculatum*), false Solomon's-seal (*Smilacina racemosa*), hog-peanut (*Amphicarpaea bracteata*), and woodland sunflower (*Helianthus strumosus*).

Southern Dry-Mesic Forest

Red oak (*Quercus rubra*) is a common dominant tree of this upland forest community type. White oak (*Q. alba*), basswood (*Tilia americana*), sugar and red maples (*Acer saccharum* and *A. rubrum*), and white ash (*Fraxinus americana*) are also important. The herbaceous understory flora is diverse and includes many species listed under Southern Dry Forest plus jack-in-the-pulpit (*Arisaema triphyllum*), enchanter's-nightshade (*Circaea lutetiana*), large-flowered bellwort (*Uvularia grandiflora*), interrupted fern (*Osmunda claytoniana*), Lady Fern (*Athyrium Filix-femina*), tick-trefoils (*Desmodium glutinosum* and *D. nudiflorum*), and hog peanut (*Amphicarpa bracteata*). To the detriment of the oaks, mesophytic tree species are becoming increasingly important under current management practices and fire suppression policies.

Southern Mesic Forest

This upland forest community occurs on rich, well-drained soils. The dominant tree species is sugar maple (*Acer saccharum*), but basswood (*Tilia americana*) and (near Lake Michigan) beech (*Fagus grandifolia*) may be co-dominant. Many other trees are found in these forests, including those of the walnut family (Juglandaceae). The understory is typically open (sometimes brushy with species of gooseberry (*Ribes*) if there is a past history of grazing) and supports fine spring ephemeral displays. Characteristic herbs are spring-beauty (*Claytonia virginica*), trout-lilies (*Erythronium* spp.), trilliums (*Trillium* spp.), violets (*Viola* spp.), bloodroot (*Sanguinaria canadensis*), blue cohosh (*Caulophyllum thalictroides*), mayapple (*Podophyllum peltatum*), and Virginia waterleaf (*Hydrophyllum virginianum*).

Wet-Mesic Prairie

This herbaceous grassland community is dominated by tall grasses including big bluestem (*Andropogon gerardii*), Canada bluejoint grass (*Calamagrostis canadensis*), cordgrass (*Spartina pectinata*), and Canada wild-rye (*Elymus canadensis*). The forb component is diverse and includes azure aster (*Aster oolentangiensis*), shooting-star (*Dodecatheon meadia*), sawtooth sunflower (*Helianthus grosseserratus*), prairie blazing-star (*Liatris pycnostachya*), prairie phlox (*Phlox pilosa*), prairie coneflower (*Ratibida pinnata*), prairie docks (*Silphium integrifolium* and *S. terebinthinaceum*), late and stiff goldenrods (*Solidago gigantea* and *S. rigida*), and culver's-root (*Veronicastrum virginicum*).

Dry Cliff (Exposed Cliff of Curtis' community classification)

These dry vertical bedrock exposures occur on many different rock types, which may influence species composition. Scattered pines, oaks, or shrubs often occur. However, the most characteristic plants are often the ferns, common polypody (*Polypodium vulgare*) and rusty woodsia (*Woodsia ilvensis*), along with herbs such as columbine (*Aquilegia canadensis*), harebell (*Campanula rotundifolia*), pale corydalis (*Corydalis sempervirens*), juneberry (*Amelanchier* spp.), bush-honeysuckle (*Diervilla lonicera*), and rock spikemoss (*Selaginella rupestris*).



Moist Cliff (Shaded Cliff of the Curtis community classification)

This "micro-community" occurs on shaded (by trees or the cliff itself because of aspect), moist to seeping mossy, vertical exposures of various rock types, most commonly sandstone and dolomite. Common species are columbine (*Aquilegia canadensis*), the fragile ferns (*Cystopteris bulbifera* and *C. fragilis*), wood ferns (*Dryopteris* spp.), rattlesnake-root (*Prenanthes alba*), and wild sarsaparilla (*Aralia nudicaulis*). The rare flora of these cliffs vary markedly in different parts of the state; Driftless Area cliffs might have northern monkshood (*Aconitum noveboracense*), those on Lake Superior, butterwort (*Pinguicula vulgaris*), or those in Door County, green spleenwort (*Asplenium viride*).

Present

Floodplain Forest (replaces in part the Southern Wet and Southern Wet-Mesic Forests of Curtis)

This is a lowland hardwood forest community that occurs along large rivers, usually stream order 3 or higher, that flood periodically. The best-development occurs along large rivers in southern Wisconsin, but this community is also found in the north. Canopy dominants may include silver maple (*Acer saccharinum*), river birch (*Betula nigra*), green ash (*Fraxinus pennsylvanica*), hackberry (*Celtis occidentalis*), swamp white oak (*Quercus bicolor*), and cottonwood (*Populus deltoides*). Northern stands are often species poor, but balsam-poplar (*Populus balsamifera*), bur oak (*Quercus macrocarpa*), and box elder (*Acer negundo*) may replace some of the missing "southern" trees. Buttonbush (*Cephalanthus occidentalis*) is a locally dominant shrub and may form dense thickets on the margins of oxbow lakes, sloughs and ponds within the forest. Nettles (*Laportea canadensis* and *Urtica dioica*), sedges, ostrich fern (*Matteuccia struthiopteris*) and gray-headed coneflower (*Rudbeckia laciniata*) are important understory herbs, and lianas such as Virginia creepers (*Parthenocissus* spp.), grapes (*Vitis* spp.), Canada moonseed (*Menispermum canadense*), and poison-ivy (*Toxicodendron radicans*) are often common. Among the striking and characteristic herbs of this community are cardinal flower (*Lobelia cardinalis*) and green dragon (*Arisaema dracontium*).

Hemlock Relict

These are isolated hemlock (*Tsuga canadensis*) stands occurring in deep, moist ravines or on cool, north or east facing slopes in southwestern Wisconsin. Associated trees include white pine (*Pinus strobus*), and yellow birch (*Betula allegheniensis*). The groundlayer includes herbaceous species with northern affinities such as shining clubmoss (*Lycopodium lucidulum*), bluebead lily (*Clintonia borealis*), Canada mayflower (*Maianthemum canadense*), and woodferns (*Dryopteris* spp). Cambrian sandstone cliffs are usually nearby and often prominent.

Cedar Glade

Dry sandstone, quartzite or dolomite exposures vegetated with dense thickets of red cedar (*Juniperus virginiana*). Red maple (*Acer rubrum*), Paper birch (*Betula papyrifera*) and black and bur oaks (*Quercus velutina* and *Q. macrocarpa*) may also be present. This community is usually if not always the result of fire suppression on dry prairies, and in pre-settlement times it may have occurred only where extensive cliffs served as firebreaks. Common herbs include bluestem and grama grasses (*Andropogon* spp. and *Bouteloua* spp.), prickly-pear cactus (*Opuntia compressa*), flowering spurge (*Euphorbia corollata*), stiff sandwort (*Arenaria stricta*) and gray goldenrod (*Solidago nemoralis*).

Sand Prairie (or Dry Sand Prairie)

This dry grassland community is composed of little bluestem (*Schizachyrium scoparium*), junegrass (*Koeleria macrantha*), panic grass (*Panicum* spp.), and crab grass (*Digitaria cognata*). Common herbaceous species are western ragweed (*Ambrosia psilostachya*), the sedges (*Carex muhlenbergii* and *C. pennsylvanica*), poverty-oat grass (*Danthonia spicata*), flowering spurge (*Euphorbia corollata*), frostweed (*Helianthemum canadense*), common bush-clover (*Lespedeza capitata*), false-heather (*Hudsonia tomentosa*), long-bearded hawkweed (*Hieracium longipilum*), stiff goldenrod (*Solidago rigida*), horsebalm (*Monarda punctata*), and spiderwort (*Tradescantia ohioensis*). At least some stands are Barrens remnants now lacking appreciable woody cover, though extensive stands may have occurred historically on broad level terraces along the Mississippi, Wisconsin, Black, and Chippewa Rivers.



Emergent Aquatic

These open, marsh, lake, riverine and estuarine communities with permanent standing water are dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures. Dominants include cat-tails (*Typha* spp.), bulrushes (particularly *Scirpus acutus*, *S. fluviatilis*, and *S. validus*), bur-reeds (*Sparganium* spp.), giant reed (*Phragmites australis*), pickerel-weed (*Pontederia cordata*), water-plantains (*Alisma* spp.), arrowheads (*Sagittaria* spp.), and the larger species of spikerush such as (*Eleocharis smallii*).

Submergent Aquatic

This herbaceous community of aquatic macrophytes occurs in lakes, ponds, and rivers. Submergent macrophytes often occur in deeper water than emergents, but there is considerable overlap. Dominants include various species of pondweeds (*Potamogeton* spp.) along with waterweed (*Elodea canadensis*), slender naiad (*Najas flexilis*), eel-grass (*Vallisneria americana*), and species of water-milfoil (*Myriophyllum*) and bladderworts (*Utricularia*).

Ephemeral Pond

These ponds are depressions with impeded drainage (usually in forest landscapes), that hold water for a period of time following snowmelt but typically dry out by mid-summer. Common aquatic plants of these habitats include yellow water crowfoot (*Ranunculus flabellaris*), mermaid weed (*Proserpinaca palustris*), Canada bluejoint grass (*Calamagrostis canadensis*), floating manna grass (*Glyceria septentrionalis*), spotted cowbane (*Cicuta maculata*), smartweeds (*Polygonum* spp.), orange jewelweed (*Impatiens capensis*), and sedges. Ephemeral ponds provide critical breeding habitat for certain invertebrates, as well as for many amphibians such as frogs and salamanders.

Shrub-Carr

This wetland community is dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), meadow-sweet (*Spiraea alba*), and various willows (*Salix discolor*, *S. bebbiana*, and *S. gracilis*). Canada bluejoint grass (*Calamagrostis canadensis*) is often very common. Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

Southern Sedge Meadow

Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*). Common associates are water-horehound (*Lycopus uniflorus*), panicked aster (*Aster simplex*), blue flag (*Iris virginica*), Canada goldenrod (*Solidago canadensis*), spotted joe-pye-weed (*Eupatorium maculatum*), broad-leaved cat-tail (*Typha latifolia*), and swamp milkweed (*Asclepias incarnata*). Reed canary grass (*Phalaris arundinacea*) may be dominant in grazed and/or ditched stands. Ditched stands can succeed quickly to Shrub-Carr.

Wet Prairie

This is a rather heterogeneous tall grassland community that shares characteristics of prairies, Southern Sedge Meadow, Calcareous Fen and even Emergent Aquatic communities. The Wet Prairie's more wetland-like character can mean that sometimes very few true prairie species are present. Many of the stands assigned to this type by Curtis are currently classified as Wet-Mesic Prairies. The dominant graminoids are Canada bluejoint grass (*Calamagrostis canadensis*), cordgrass (*Spartina pectinata*), and prairie muhly (*Muhlenbergia glomerata*), plus several sedge (*Carex*) species including lake sedge (*C. lacustris*), water sedge (*C. aquatilis*), and woolly sedge (*C. lanuginosa*). Many of the herb species are shared with Wet-Mesic Prairies, but the following species are often prevalent: New England aster (*Aster novae-angliae*), swamp thistle (*Cirsium muticum*), northern bedstraw (*Galium boreale*), yellow stargrass (*Hypoxis hirsuta*), cowbane (*Oxypolis rigidior*), tall meadow-rue (*Thalictrum dasycarpum*), golden alexander (*Zizia aurea*), and mountain-mint (*Pycnanthemum virginianum*).

