

**AGRICULTURAL,  
NATURAL, AND  
CULTURAL  
ELEMENT**

**Appendix  
E-1**

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**Appendix E-1**
**Dry Cliff (Exposed Cliff of Curtis' community classification)**

With dry vertical bedrock exposures, thin-soiled, very dry communities occur on many different rock types, which are thus quite varied in species composition. Scattered pines, oaks, or shrubs often occur. However, the most characteristic plants are often the ferns such as common polypody (*Polypodium vulgare*) and rusty woodsia (*Woodsia ilvensis*). The following herbs are also common, such as: columbine (*Aquilegia canadensis*), harebell (*Campanula rotundifolia*), pale corydalis (*Corydalis sempervirens*), juneberry (*Amelanchier spp.*), bush-honeysuckle (*Diervilla lonicera*), and rock spikemoss (*Selaginella rupestris*), and fringe bindweed (*Polygonum cilinode*).

**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 such as little bluestem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), and prairie dropseed (*Sporobolus heterolepis*), are the dominants in this community, along with the larger big bluestem (*Andropogon gerardii*). 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*).

**Dry-Mesic Prairie**

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

**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 are often species of cattails (*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*).

**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 southern rivers in southern Wisconsin, but this community is also found in the northern Wisconsin. 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*). 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 green-headed coneflower (*Rudbeckia laciniata*), cardinal flower (*Lobelia cardinalis*), green dragon (*Arisaema dracontium*), and false dragonhead (*Physostegia virginiana*).

**Forested Seep**

These are shaded seepage areas with active spring discharges in (usually) hardwood forests that may host a number of uncommon to rare species. The oversotry dominant is frequently black ash (*Fraxinus nigra*), but yellow birch (*Betula allegheniensis*), American elm (*Ulmus americanus*), and many other tree species maybe present including conifers such as hemlock (*Tsuga Canadensis*) or white pine (*Pinus strobes*). Undersotry species include skunk cabbage (*Symplocarpus foetidus*), water-pennywort (*Hydrocotyle americanus*), marsh blue violet (*Viola cucullata*), swamp saxifrage (*Saxifraga pennsylvanica*), golden saxifrage (*Chyososplenium americanum*), golden ragwort (*Sececio aureus*), silvery spleenwort (*Athyrium thelypteroides*), and the rare

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**Appendix E-1**


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sedeges (*Carex scabrata* and *C. prasina*). Most documented occurrences are in the Driftless area, or locally along major rivers flanked by steep bluffs.

**Ephemeral Pond**

These ponds are depressions with pockets of impeded drainage (usually in forest landscapes), which 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 primarily Southern wetland community is usually dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), but meadow-sweet (*Spiraea alba*), and various willows (*Salix discolor*, *S. bebbiana*, and *S. gracilis*) are frequently also important. Canada grass bluejoint grass (*Calamagrostis canadensis*) is often very common. Other herbs 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 a tussock marsh dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*). Common associates are water-horehound (*Lycopus uniflorus*), panicled aster (*Aster simplex*), blue flag (*Iris virginica*), Canada goldenrod (*Solidago canadensis*), spotted joe-pye-weed (*Eupatorium maculatum*), broad-leaved common cattail (*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-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*).

**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*), woodferns (*Dryopteris spp.*), and mountain maple (*Acer spicatum*). Cambrian sandstone cliffs are usually nearby and often prominent.

**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*), tall switchgrass (*Panicum virgatum*), and switch grass (*Bouteloua curtipendula*) 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*).

**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

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**Appendix E-1**

are columbine (*Aquilegia canadensis*), the fragile ferns (*Cystopteris bulbifera* and *C. fragilis*), wood ferns (*Dryopteris* spp.), polypody (*Polypodium vulgare*), 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*).

**Oak Opening**

As defined by Curtis, this is an oak-dominated savanna community in which there is a less than 50% tree canopy. Historically, oak openings occurred on wet-mesic to dry sites. The few extant remnants are mostly on drier sites; the mesic and wet-mesic openings are 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 dry prairies, with many of the same grasses and forbs present, there are some plants and animals that reach their optimal abundance in the "openings".

**Pine Barrens**

This savanna community is characterized by scattered small jack pines (*Pinus banksiana*), or less commonly, red pines (*P. resinosa*), often sometimes mixed with scrubby Hill's and bur oaks (*Quercus ellipsoidalis* and *Q. macrocarpa*), interspersed with openings in which shrubs (such as hazelnuts (*Corylus* spp.) and prairie willow (*Salix humilis*)) and herbs dominate. The flora often contains species characteristic of "heaths" such as blueberries (*Vaccinium angustifolium* and *V. myrtilloides*), bearberry (*Arctostaphylos uva-ursi*), American hazelnut (*Corylus americana*), sweet fern (*Comptonia peregrina*), and sand fire cherry (*Prunus pensylvanica*). Also present are dry sand prairie species such as June grass (*Koeleria macrantha*), little bluestem (*Schizachyrium scoparium*), silky and sky-blue asters (*Aster sericeus* and *A. azureus*), lupine (*Lupinus perennis*), blazing stars (*Liatris aspera* and *L. cylindracea*), and western sunflower (*Helianthus occidentalis*). Pines may be infrequent, even absent, in some stands in northern Wisconsin and elsewhere because of past logging, altered fire regimes, and an absence of seed source.

**Pine Relicts**

These isolated stands of white pine (*Pinus strobus*) and red pine (*P. resinosa*) or, less commonly, jack pine (*P. banksiana*), which 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.

**Sand Barrens**

Sand Barrens are herbaceous upland communities that are best developed on unstable or semi-stabilized alluvial sands along major rivers such the Mississippi and Wisconsin Rivers. They are partly or perhaps wholly anthropogenic in origin, occurring on sites historically disturbed by plowing or very heavy past grazing. Unvegetated "blow-outs" are characteristic features. Barrens, Dry Prairie and Sand Prairie species such as false-heather (*Hudsonia tomentosa*), bearberry (*Arctostaphylos uva-ursi*), sedges (*Cyperus filiculmis* and *C. schweinitzii*), sand cress (*Arabis lyrata*), three-awn grasses (*Aristida* spp.), rock spikemoss (*Selaginella rupestris*), and the earthstar fungi (*Geaster* spp.) are present in this community. Many exotics are present, and as well as rare disturbance dependent species such as fame flower (*Talinum rugospermum*) occur in some stands.

**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. pensylvanica*), 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*). It is often the remnant of an Oak Barrens. 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.

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**Appendix E-1**

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**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 spp.*) 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*).