



Southern Dry-Mesic Pine-Oak Woodland

Dry-mesic (or dry) hardwood or pine-hardwood woodlands on sand deposits, primarily in the blufflands of southeastern Minnesota.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 13 plots (relevés).

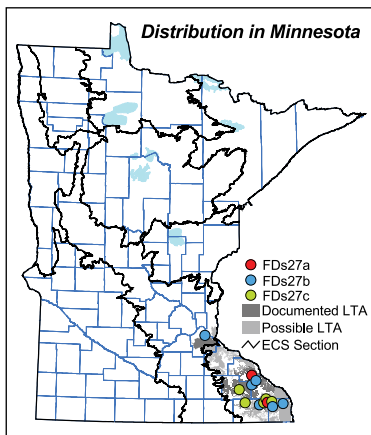
- **Ground-layer** cover is variable, ranging from sparse to interrupted (5–75%), with prairie species often present. Important species include flowering spurge (*Euphorbia corollata*), pussytoes (*Antennaria* spp.), harebell (*Campanula rotundifolia*), elliptic shinleaf (*Pyrola elliptica*), white rattlesnakeroot (*Prenanthes alba*), round-lobed hepatica (*Anemone americana*), downy rattlesnake plantain (*Goodyera pubescens*), heart-leaved aster (*Aster cordifolius*), and yarrow (*Achillea millefolium*). Other common species include northern bedstraw (*Galium boreale*), Clayton's sweet cicely (*Osmorhiza claytonii*), lopseed (*Phryma leptostachya*), columbine (*Aquilegia canadensis*), hog peanut (*Amphicarpaea bracteata*), white snakeroot (*Eupatorium rugosum*), bracken (*Pteridium aquilinum*), and Pennsylvania sedge (*Carex pensylvanica*). The community provides important habitat for several rare sand-loving plants, especially Canada forked chickweed (*Paronychia canadensis*) and marginal shield fern (*Dryopteris marginalis*) and also rough-seeded famelflower (*Talinum rugospermum*), goat's rue (*Tephrosia virginiana*), ebony spleenwort (*Asplenium platyneuron*), and seaside three-awn (*Aristida tuberculosa*).

- **Climbing plants and vines** are common but generally short. Common species include Virginia creeper (*Parthenocissus vitacea*) and wild grape (*Vitis riparia*).

- **Shrub-layer** cover is mostly patchy to interrupted (25–75%). White pine, bitternut hickory, white oak, pin cherry, and eastern red cedar are important tree saplings, while ninebark (*Physocarpus opulifolius*), bush juniper (*Juniperus communis*), and black raspberry (*Rubus occidentalis*) are important shrubs. Other common shrub-layer species include American hazelnut (*Corylus americana*), prickly ash (*Zanthoxylum americanum*), black cherry, gray dogwood (*Cornus racemosa*), and common poison ivy (*Toxicodendron rydbergii*). Pipsissewa (*Chimaphila umbellata*) and leadplant (*Amorpha canescens*) are typical half-shrubs.

- **Subcanopy** is sparse to patchy (25–100% cover) and often poorly differentiated from the canopy. White pine, eastern red cedar, black cherry, black oak, and white oak are often present.

- **Canopy** cover is patchy to interrupted (25–75%). Canopy is typically dominated by one or more of the following: white pine, jack pine, black oak, or bitternut hickory. Other common species include bur oak, northern pin oak, white oak, and paper birch. Northern red oak, black cherry, quaking aspen, and basswood are occasional.



Landscape Setting & Soils

- **Sand terraces and other sand deposits**—Uncommon. Present on deep sands that have accumulated on valley floors of tributary streams or rivers of the Mississippi River south of the Twin Cities metropolitan area. Most of the sands originate from stream dissection and disintegration of local sandstone, but a few stream bottoms have sands derived from glacial outwash and from stream dissection of glacial till above the sandstone bedrock. Because of the mantle of silty loess that covers the uplands of the PPL, it is likely that fine sands were deposited in the area by wind as well. The sands



are deposited in a variety of landforms including stream terraces, alluvial fans, ramps created by sand blown from valley floors onto adjacent slopes, and mixed deposits of sand and rocks (colluvium) at bases of sandstone outcrops. Although the bedrock from which sands are derived initially contained some carbonates, soils are poor and acidic. Soils tend to be uniformly sandy, lacking subsoil horizons or textural bands that can help to hold or perch snowmelt and rainfall. Soils are excessively drained. Soil-moisture regime is moderately dry. (Blufflands and Rochester Plateau in PPL; very local in Oak Savanna in MIM)

Natural History

In the past, fires were very common throughout the range of FDs27. An analysis of Public Land Survey (PLS) records indicates that the rotation of catastrophic fires was about 135 years, and the rotation of mild surface fires about 15 years. The rotation of all fires combined is estimated to be 14 years. Windthrow was not reported in the surveyors' notes for this community. (The PLS data for this community are too limited to propose growth stages. Most (97%) of the bearing trees within the primary range of this community were oak trees. Bur oak was by far the most abundant, black oak was occasional, and northern pin oak and white oak were infrequent. The surveyors described this community mostly as scattered timber or oak openings. Jack pine and white pine are present in some modern stands; however, no pine bearing trees were reported by land surveyors.)

Similar Native Plant Community Classes

• FDs38 Southern Dry-Mesic Oak-Hickory Woodland

The ranges of FDs38 and FDs27 overlap in the Bufflands Subsection of the PPL, and both communities have prairie plants in the understory. FDs38 is much more common, occurring on silty soils on upper portions of south- to west-facing bluffs rather than on sandy soils.

FDs27 Indicator Species	(freq%)	
	FDs27	FDs38
White pine (C,U)	54	-
Canada mayflower (<i>Maianthemum canadense</i>)	46	-
Downy rattlesnake plantain (<i>Goodyera pubescens</i>)	38	-
Pipsissewa (<i>Chimaphila umbellata</i>)	31	-
Yarrow (<i>Achillea millefolium</i>)	31	-
Pin cherry (<i>Prunus pensylvanica</i>)	23	-
Flowering spurge (<i>Euphorbia corollata</i>)	62	6
Black oak (C,U)	31	6

FDs38 Indicator Species	(freq%)	
	FDs27	FDs38
Shagbark hickory (C)	-	76
Smooth sumac (<i>Rhus glabra</i>)	-	24
Jack-in-the-pulpit (<i>Arisaema triphyllum</i>)	-	24
Heart-leaved alexanders (<i>Zizia aptera</i>)	-	24
Prickly gooseberry (<i>Ribes cynosbati</i>)	15	71
Black walnut (C,U)	8	35
Horse gentian (<i>Triosteum perfoliatum</i>)	8	35
Woodland sunflower (<i>Helianthus strumosus</i>)	15	59

• FDs37 Southern Dry-Mesic Oak (Maple) Forest

FDs37 is similar to FDs27 but has not been documented as far south as the PPL. The ranges of the two classes may overlap in southern parts of the MIM, where minimal plant community surveys have been done.

FDs27 Indicator Species	(freq%)	
	FDs27	FDs37
Flowering spurge (<i>Euphorbia corollata</i>)	62	-
Heart-leaved aster (<i>Aster cordifolius</i>)	46	-
Downy rattlesnake plantain (<i>Goodyera pubescens</i>)	38	-
Elm-leaved goldenrod (<i>Solidago ulmifolia</i>)	38	-
Black oak (C,U)	31	-
White pine (C)	46	2
Bitternut hickory (C,U)	62	4
Eastern red cedar (C,U)	62	4

FDs37 Indicator Species	(freq%)	
	FDs27	FDs37
Red maple (C,U)	-	67
Pale bellwort (<i>Uvularia sessilifolia</i>)	-	62
Large-leaved aster (<i>Aster macrophyllus</i>)	-	51
Mountain rice grass (<i>Oryzopsis asperifolia</i>)	-	42
Beaked hazelnut (<i>Corylus cornuta</i>)	-	24
Starflower (<i>Trientalis borealis</i>)	-	22
Downy arrowwood (<i>Viburnum rafinesquianum</i>)	8	49
Bush honeysuckle (<i>Diervilla lonicera</i>)	8	36

• UPs14 Southern Dry Savanna

UPs14 can be similar to FDs27, especially occurrences on windblown sand (UPs14a). UPs14 often grades into FDs27 on areas of sand deposits with northerly aspects or without periodic fire, and the two classes share a number of prairie and woodland plants. UPs14 has a sparse to patchy canopy (5–25% cover), little woody vegetation in the understory, and more prairie species (especially grasses) and fewer woodland herbs in the ground layer. FDs27 has a patchy to interrupted canopy (25–75% cover), at least some woody understory vegetation present, and a ground layer dominated by woodland grasses and forbs with prairie species generally restricted to small canopy openings.



FDs27 Indicator Species	(freq%)	
	FDs27	UPs14
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	85	-
Basswood (U)	62	-
White oak (C,U)	54	-
Paper birch (C,U)	46	-
Ironwood (C,U)	46	-
Pagoda dogwood (<i>Cornus alternifolia</i>)	46	-
Elliptic shinleaf (<i>Pyrola elliptica</i>)	46	-
Lopseed (<i>Phryma leptostachya</i>)	69	3

UPs14 Indicator Species	(freq%)	
	FDs27	UPs14
Junegrass (<i>Koeleria pyramidata</i>)	-	80
Western ragweed (<i>Ambrosia psilostachya</i>)	-	80
Porcupine grass (<i>Stipa spartea</i>)	-	73
Virginia ground cherry (<i>Physalis virginiana</i>)	-	73
Bearded birdfoot violet (<i>Viola palmata</i>)	-	53
Schweinitz's nut sedge (<i>Cyperus schweinitzii</i>)	-	47
Green-flowered peppergrass (<i>Lepidium densiflorum</i>)	-	40
Rough blazing star (<i>Liatris aspera</i>)	-	33

Native Plant Community Types in Class

• FDs27a Jack Pine - Oak Woodland (Sand)

Dry to dry-mesic pine-hardwood woodlands. The presence of jack pine in the canopy and understory differentiate FDs27a from the other types in this class. Important half-shrub and ground-layer plants include pipsissewa, lowbush blueberry (*Vaccinium angustifolium*), pussytoes, bluets (*Hedyotis longifolia*), round-headed bush-clover (*Lespedeza capitata*), hairy puccoon (*Lithospermum carolinense*), and starry false Solomon's seal (*Smilacina stellata*). FDs27a is rare and has been documented at only three sites in the Blufflands Subsection of the PPL. Description is based on summary of vegetation data from 2 plots.

• FDs27b White Pine - Oak Woodland (Sand)

Dry-mesic pine-hardwood woodlands. The presence of white pine and northern red oak in the canopy and understory helps to distinguish FDs27b from the other types in this class. Important herbaceous plants include wild sarsaparilla (*Aralia nudicaulis*), zigzag goldenrod (*Solidago flexicaulis*), common enchanter's nightshade (*Circaea lutetiana*), harebell, bastard toadflax (*Comandra umbellata*), and carrion flowers (*Smilax* spp.). FDs27b is uncommon. Description is based on summary of vegetation data from 6 plots.

• FDs27c Black Oak - White Oak Woodland (Sand)

Dry to dry-mesic hardwood woodlands. The presence of northern pin oak or black oak as canopy dominants helps to distinguish FDs27c from the other types in this class. Pin cherry is also more likely to occur in FDs27c. Important ground-layer plants include woodland sunflower (*Helianthus strumosus*), Indian pipe (*Monotropa uniflora*), wild strawberries (*Fragaria virginiana* and *F. vesca*), and elm-leaved goldenrod (*Solidago ulmifolia*). FDs27c is the most common of the three community types in this class. Description is based on summary of vegetation data from 5 plots.



Rushford Sand Barrens Scientific and Natural Area, Fillmore County, MN

photo by K.A. Rusterholz MN DNR



FDS27 Southern Dry-Mesic Pine-Oak Woodland – Species Frequency & Cover

		freq% cover		freq% cover		
Forbs, Ferns & Fern Allies						
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	85	•	•			
Northern bedstraw (<i>Galium boreale</i>)	85	•	•			
Columbine (<i>Aquilegia canadensis</i>)	77	•	•			
Hog peanut (<i>Amphicarpaea bracteata</i>)	77	•	•			
Lopseed (<i>Phytolmia leptostachya</i>)	69	•	•			
Bracken (<i>Pteridium aquilinum</i>)	69	••	••			
White snakeroot (<i>Eupatorium rugosum</i>)	69	•	•			
Flowering spurge (<i>Euphorbia corollata</i>)	62	•	•			
Common false Solomon's seal (<i>Smilacina racemosa</i>)	62	•	•			
Pointed-leaved tick trefoil (<i>Desmodium illinosum</i>)	54	•	•			
White rattlesnakeroot (<i>Prenanthes alba</i>)	46	•	•			
Heart-leaved aster (<i>Aster cordifolius</i>)	46	•	•			
Elliptic shinleaf (<i>Pyrola elliptica</i>)	46	•	•			
Common enhanter's nightshade (<i>Circaea luteiflana</i>)	46	•	•			
Canada mayflower (<i>Maianthemum canadense</i>)	46	•	•			
Wild sarsaparilla (<i>Aralia nudicaulis</i>)	46	•	•			
Elm-leaved goldenrod (<i>Solidago ulmifolia</i>)	38	•	•			
Common strawberry (<i>Fragaria virginiana</i>)	38	•	•			
Harebell (<i>Campanula rotundifolia</i>)	38	•	•			
Gregarious black snakeroot (<i>Sanicula gregaria</i>)	38	•	•			
Pussytoes (<i>Artemisia</i> spp.)	38	•	•			
Downy rattlesnake plantain (<i>Goodyera pubescens</i>)	38	•	•			
Sweet-scented bedstraw (<i>Galium triflorum</i>)	38	•	•			
White avens (<i>Geum canadense</i>)	38	•	•			
Spreading dogbane (<i>Apocynum androsaemifolium</i>)	31	•	•			
Round-lobed hepatica (<i>Anemone americana</i>)	31	•	•			
Wood anemone (<i>Anemone quinquefolia</i>)	31	•	•			
Wild geranium (<i>Geranium maculatum</i>)	31	•	•			
Shining bedstraw (<i>Galium concinnum</i>)	31	•	•			
Yarrow (<i>Achillea millefolium</i>)	31	•	•			
Rattlesnake fern (<i>Botrychium virginianum</i>)	31	•	•			
Lady fern (<i>Athyrium filix-femina</i>)	31	•	•			
Grasses & Sedges						
Pennsylvania sedge (<i>Carex pensylvanica</i>)	100	••••	••••			
Climbing Plants						
Virginia creeper (<i>Parthenocissus</i> spp.)				92	••	
Wild grape (<i>Vitis riparia</i>)				77	•	
Greenbrier (<i>Smilax tamnoides</i>)				31	•	
Low Shrubs						
Black raspberry (<i>Rubus occidentalis</i>)				54	••	
Red raspberry (<i>Rubus idaeus</i>)				38	••	
Pipsissewa (<i>Chimaphila umbellata</i>)				31	••	
Leadplant (<i>Amorpha canescens</i>)				31	•	
Lowbush blueberry (<i>Vaccinium angustifolium</i>)				15	•	
Shrubs						
American hazelnut (<i>Corylus americana</i>)				92	•••	
Missouri gooseberry (<i>Ribes missouriense</i>)				85	••	
Prickly ash (<i>Zanthoxylum americanum</i>)				85	••	
Poison ivy (<i>Toxicodendron rydbergii</i>)				77	•	
Gray dogwood (<i>Cornus racemosa</i>)				62	••	
Chokecherry (<i>Prunus virginiana</i>)				62	••	
Pagoda dogwood (<i>Cornus alternifolia</i>)				46	•	
Pin cherry (<i>Prunus pensylvanica</i>)				23	•••	
Trees						
	freq %	Canopy cover	Subcanopy cover	Shrub Layer cover		
White pine	46	•••••	46	•••	54	•
Paper birch	46	••	23	•	15	•
Bur oak	46	••	15	••	23	•
Northern pin oak	46	•••••	31	•••	23	••
White oak	38	•••	46	••	46	•
Black oak	31	••••	31	•••	31	•••
Northern red oak	31	•••	23	•••	31	••
Bitternut hickory	23	•	23	•	62	•
Black cherry	23	•	62	••	77	•
Basswood	23	•	46	•	46	•
Ironwood	15	•••	38	•••	38	•
Jack pine	15	•	8	•	8	•
Eastern red cedar	15	•	46	•	38	•