



Southern Dry-Mesic Oak-Hickory Woodland

Dry-mesic (or dry) deciduous woodlands on steep, exposed, south- to west-facing bluffs in southeastern Minnesota, often adjacent to bedrock bluff prairies.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 17 plots (relevés).

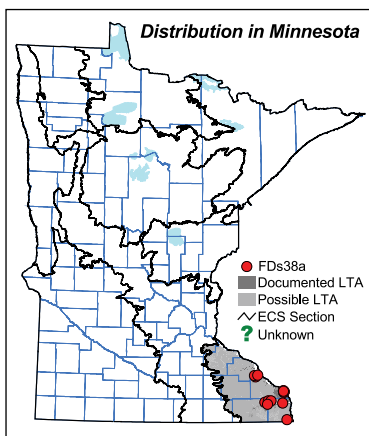
- **Ground-layer** cover is mostly patchy to continuous (25–100%). Important species include woodland sunflower (*Helianthus strumosus*), white snakeroot (*Eupatorium rugosum*), elm-leaved goldenrod (*Solidago ulmifolia*), shining bedstraw (*Galium concinnum*), Canadian and gregarious black snake-roots (*Sanicula canadensis* and *S. gregaria*), and heart-leaved alexanders (*Zizia aptera*). Other common species include honewort (*Cryptotaenia canadensis*), Clayton's sweet cicely (*Osmorhiza claytonii*), lopseed (*Phryma leptostachya*), pointed-leaved tick trefoil (*Desmodium glutinosum*), hog peanut (*Amphicarpaea bracteata*), common enchanter's nightshade (*Circaea lutetiana*), and Pennsylvania sedge (*Carex pensylvanica*).

- **Climbing plants and vines** are sparse to patchy (5–50% cover); greenbrier (*Smilax tamnoides*), wild grape (*Vitis riparia*), and Virginia creeper (*Parthenocissus vitacea*) are often present.

- **Shrub-layer** cover ranges from patchy to often dense (25–100%). Shagbark hickory and hackberry are important tree saplings. Other common species include American hazelnut (*Corylus americana*), gray dogwood (*Cornus racemosa*), poison ivy (*Toxicodendron rydbergii*), prickly ash (*Zanthoxylum americanum*), prickly gooseberry (*Ribes cynosbati*), red raspberry (*Rubus strigosus*), black cherry, and American elm.

- **Subcanopy** is patchy to continuous (25–100% cover) and often poorly differentiated from the canopy. Shagbark hickory, black cherry, hackberry, and black walnut are characteristic; other common species include American elm, red elm, box elder, bur oak, and paper birch.

- **Canopy** cover is interrupted to continuous (75–100%), often with large, open-grown trees present. Bur oak, shagbark hickory, American elm, black walnut, and box elder are characteristic. Other common species include northern pin oak, white oak, northern red oak, and black cherry.



Landscape Setting & Soils

- **Steep, loess-covered bedrock bluffs**—Common. Present in dissected bedrock terrain where little of the original plateau remains as interfluvies between stream valleys. Most common on steep, south-facing slopes. Parent material is a mantle of wind-deposited silt about 15–30in (50–75cm) thick over older soil surfaces. The old soils are calcareous, but the wind-deposited silt is not. Depth to bedrock generally exceeds 30in, although cobbles and flagstones are common throughout the soil profile. Outcrops of sandstone, limestone, or dolomite are occasionally present. Soils have dark surface horizons, suggesting that these sites were formerly occupied by prairies or open woodlands, or that the post-fire condition of this community is prairielike. Some subsoil horizons have modest accumulations of clay, but these horizons do not appear to perch water, either because they are poorly developed or because the typically steep slopes promote drainage. Soils deeper than 60in (150cm) over bedrock are well drained and have a fresh soil-moisture regime. Shallower soils over bedrock are excessively drained and have a dry soil-moisture regime. (Blufflands in PPL)



Natural History

In the past, fires were very common throughout the range of FDs38. An analysis of Public Land Survey records indicates that the rotation of catastrophic fires was about 150 years, and the rotation of mild surface fires about 15 years. The rotation of all fires combined is estimated to be 11 years. Windthrow was not common, with the estimated rotation exceeding 1,000 years. Based on the historic composition and age structure of these forests, FDs38 had three growth stages.

- **0–55 years**—Young forests recovering from fire and dominated by bur oak mixed with northern pin oak and northern red oak. Paper birch is a minor component.
- **55–135 years**—Mature forests dominated by bur oak mixed with lesser amounts of pin oak, paper birch and northern red oak than young forests. Shagbark hickory and white oak are minor components.
- **> 135 years**—Old forests dominated by bur oak mixed with white oak and some northern red oak; shagbark hickory is apparently absent. (Most current examples of FDs38 originated as brushlands, oak savannas, or dry prairies and developed into woodlands in the past 75–150 years following suppression of wildfires.)

Similar Native Plant Community Classes

• FDs27 Southern Dry-Mesic Pine-Oak Woodland

FDs27 and FDs38 both occur in the Bufflands Subsection of the PPL, and both can have northern pin oak and bur oak in the canopy and prairie plants in the understory. FDs27 is much less common and is restricted to sandy terraces, while FDs38 occurs widely on silty soils on upper south- to west-facing bluffs.

FDs38 Indicator Species	(freq%)	
	FDs38	FDs27
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>)	71	15
Black walnut (C,U)	35	8
Shagbark hickory (U)	88	23
Honewort (<i>Cryptotaenia canadensis</i>)	82	23

FDs27 Indicator Species	(freq%)	
	FDs38	FDs27
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
Flowering spurge (<i>Euphorbia corollata</i>)	6	62
Ironwood (U)	6	46
Juneberries (<i>Amelanchier</i> spp.)	6	46
Black oak (C,U)	6	31

• FDs37 Southern Dry-Mesic Oak (Maple) Forest

FDs37 has not been documented in the PPL but may overlap in range with FDs38 in the southern MIM, where plant community survey efforts have been minimal. (Occurrences of FDs37 in the Minnesota River valley [FDs37b] appear to be most similar to FDs38 but have not been sampled using vegetation plot data and may not be represented well in this comparison.)

FDs38 Indicator Species	(freq%)	
	FDs38	FDs37
Shagbark hickory (C,U)	88	-
Elm-leaved goldenrod (<i>Solidago ulmifolia</i>)	53	-
Greenbrier (<i>Smilax tamnoides</i>)	59	2
Shining bedstraw (<i>Galium concinnum</i>)	41	2
Horse gentian (<i>Triosteum perfoliatum</i>)	35	2
Black walnut (C,U)	35	2
White snakeroot (<i>Eupatorium rugosum</i>)	76	7
Bitternut hickory (U)	47	4

FDs37 Indicator Species	(freq%)	
	FDs38	FDs37
Canada mayflower (<i>Maianthemum canadense</i>)	-	76
Red maple (C,U)	-	67
Pale bellwort (<i>Uvularia sessilifolia</i>)	-	62
Large-leaved aster (<i>Aster macrophyllus</i>)	-	51
Downy arrowwood (<i>Viburnum rafinesquianum</i>)	-	49
Mountain rice grass (<i>Oryzopsis asperifolia</i>)	-	42
Bush honeysuckle (<i>Diervilla lonicera</i>)	-	36
Early meadow-rue (<i>Thalictrum dioicum</i>)	-	33

• MHs37 Southern Dry-Mesic Oak Forest

MHs37 and FDs38 share many common forest plants, and the ranges of the two classes overlap in southeastern Minnesota. MHs37 tends to occur on more mesic sites (generally north- to east-facing slopes) and lacks the prairie species present in FDs38.

FDs38 Indicator Species	(freq%)	
	FDs38	MHs37
Eastern red cedar (U)	29	-
Canadian black snakeroot (<i>Sanicula canadensis</i>)	29	-
Wild bergamot (<i>Monarda fistulosa</i>)	24	-
Heart-leaved alexanders (<i>Zizia aptera</i>)	24	-
Northern pin oak (U)	53	7
Greenbrier (<i>Smilax tamnoides</i>)	59	9
Quaking aspen (C,U)	35	5
Elm-leaved goldenrod (<i>Solidago ulmifolia</i>)	53	14

MHs37 Indicator Species	(freq%)	
	FDs38	MHs37
Spreading Jacob's ladder (<i>Polemonium reptans</i>)	-	47
Bloodroot (<i>Sanguinaria canadensis</i>)	-	40
Early meadow-rue (<i>Thalictrum dioicum</i>)	-	35
Round-leaved dogwood (<i>Cornus rugosa</i>)	-	30
American spikenard (<i>Aralia racemosa</i>)	-	30
Virginia waterleaf (<i>Hydrophyllum virginianum</i>)	-	30
Maidenhair fern (<i>Adiantum pedatum</i>)	6	56
Blue cohosh (<i>Caulophyllum thalictroides</i>)	6	47



• UPs14 Southern Dry Savanna

UPs14 and FDs38 share a number of prairie and woodland plants, and UPs14 often grades into FDs38 on steep, northerly slopes and in settings without periodic fire. UPs14 has a sparse to patchy canopy (5–50% cover), little woody vegetation in the understory, and more prairie species (especially grasses) and fewer woodland species in the ground layer. FDs38 has a patchy to interrupted tree canopy (25–75% cover), at least some woody vegetation present in the understory, and a ground layer dominated by woodland grasses and forbs with prairie species less common and generally restricted to small canopy openings.

FDs38 Indicator Species	(freq%)	
	FDs38	UPs14
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	100	-
Honewort (<i>Cryptotaenia canadensis</i>)	82	-
Sweet-scented bedstraw (<i>Galium triflorum</i>)	71	-
Rattlesnake fern (<i>Botrychium virginianum</i>)	65	-
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	65	-
Shagbark hickory (C,U)	88	3
Lopseed (<i>Phryma leptostachya</i>)	88	3
Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	100	6

UPs14 Indicator Species	(freq%)	
	FDs38	UPs14
Western ragweed (<i>Ambrosia psilostachya</i>)	-	73
Junegrass (<i>Koeleria pyramidata</i>)	-	73
Virginia ground cherry (<i>Physalis virginiana</i>)	-	67
Porcupine grass (<i>Stipa spartea</i>)	-	67
Hairy puccoon (<i>Lithospermum carolinense</i>)	-	64
Hoary frostweed (<i>Helianthemum bicknellii</i>)	-	61
Gray goldenrod (<i>Solidago nemoralis</i>)	-	61
Big bluestem (<i>Andropogon gerardii</i>)	-	61

Native Plant Community Types in Class

• FDs38a Oak - Shagbark Hickory Woodland

FDs38a is the only community type recognized in this class at present. The sample size of the community is small, however, with many of the plots from Great River Bluffs State Park in Winona County. In addition, it is likely that the composition of much of the community in Minnesota—including the plots used in this classification—has been influenced by livestock grazing. Collection of additional data in dry-mesic woodlands in the PPL and to the west in the MIM and the CGP would improve the understanding of this community. Description is based on summary of vegetation data from 17 plots.



photo by D.S. Wovcha MN DNR

Cannon River Wilderness Area, Rice County, MN



FDs38 Southern Dry-Mesic Oak-Hickory Woodland – Species Frequency & Cover

	freq%	cover	freq%	cover
Forbs, Ferns & Fern Allies				
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	100	••		
Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	100	•••		
Lopseed (<i>Phytolacca leptostachya</i>)	88	•		
Honewort (<i>Cryptotaenia canadensis</i>)	82	•		
Hog peanut (<i>Amphicarpaea bracteata</i>)	82	••		
White snakeroot (<i>Eupatorium rugosum</i>)	76	••		
Sweet-scented bedstraw (<i>Galium triflorum</i>)	71	•		
Common chanter's nightshade (<i>Circaea lutetiana</i>)	65	•		
Rattlesnake fern (<i>Botrychium virginianum</i>)	65	•		
Woodland sunflower (<i>Helianthus strumosus</i>)	59	•		
Gregarious black snakeroot (<i>Sanicula gregaria</i>)	59	•		
Elm-leaved goldenrod (<i>Solidago ulmifolia</i>)	53	•		
Common false Solomon's seal (<i>Smilacina racemosa</i>)	47	•		
White avens (<i>Geum canadense</i>)	47	•		
Wild geranium (<i>Geranium maculatum</i>)	47	•		
Agrimony (<i>Agrimonia</i> spp.)	47	•		
Shining bedstraw (<i>Galium concinnum</i>)	41	•		
Northern bedstraw (<i>Galium boreale</i>)	41	•		
Virginia thimbleweed (<i>Anemone virginiana</i>)	35	•		
Canada goldenrod (<i>Solidago canadensis</i>)	35	•		
Horse gentian (<i>Triosteum perfoliatum</i>)	35	•		
Erect, Smooth, or Illinois carrion-flower *	35	•		
Wild sarsaparilla (<i>Aralia nudicaulis</i>)	29	••		
Canadian black snakeroot (<i>Sanicula canadensis</i>)	29	••		
Lady fern (<i>Athyrium filix-femina</i>)	24	•		
Heart-leaved alexanders (<i>Zizia aptera</i>)	24	•		
Side-flowering aster (<i>Aster lateriflorus</i>)	24	••		
Wild bergamot (<i>Monarda fistulosa</i>)	24	•		
Grasses & Sedges				
Pennsylvania sedge (<i>Carex pensylvanica</i>)	71	••		
Thin-leaved sedge (<i>Carex sparganoides</i>)	29	•		
Starry sedge (<i>Carex rosea</i> and <i>C. radiata</i>)	24	•		
Climbing Plants				
Wild grape (<i>Vitis riparia</i>)	100	••		
Virginia creeper (<i>Parthenocissus</i> spp.)			94	•••
Greenbrier (<i>Smilax taminoides</i>)			59	•
Low Shrubs				
Red raspberry (<i>Rubus idaeus</i>)			53	•••
Tall blackberries (<i>Rubus allegheniensis</i> and similar <i>Rubus</i> spp.)			41	•••
Black raspberry (<i>Rubus occidentalis</i>)			41	••
Shrubs				
American hazelnut (<i>Corylus americana</i>)			94	•••
Gray dogwood (<i>Cornus racemosa</i>)			88	•
Pickly gooseberry (<i>Ribes cynosbati</i>)			71	••
Pickly ash (<i>Zanthoxylum americanum</i>)			71	•••
Poison ivy (<i>Toxicodendron rydbergii</i>)			71	•
Chokecherry (<i>Prunus virginiana</i>)			59	••
Pagoda dogwood (<i>Cornus alternifolia</i>)			35	•
Missouri gooseberry (<i>Ribes missouriense</i>)			29	••
Nannyberry (<i>Viburnum lentago</i>)			29	••
Smooth sumac (<i>Rhus glabra</i>)			24	•
Trees				
Bur oak	94	••••	47	•••
Shagbark hickory	76	•••	82	••
Northern pin oak	59	••••	24	•
American elm	59	•••	65	•••
Black cherry	41	•••	82	•••
Black walnut	35	••	29	••
Northern red oak	29	•••	35	•
Box elder	24	••	47	•••
White oak	24	•••	-	18
Quaking aspen	24	•	18	•
Paper birch	24	•	29	•
Red elm	18	•	35	••
Hackberry	12	••	35	••
Bitternut hickory	12	•••	24	•
Basswood	12	•	29	•

* Erect, Smooth, or Illinois carrion-flower (*Smilax ecirrata*, *S. herbacea*, or *S. illinoensis*)