



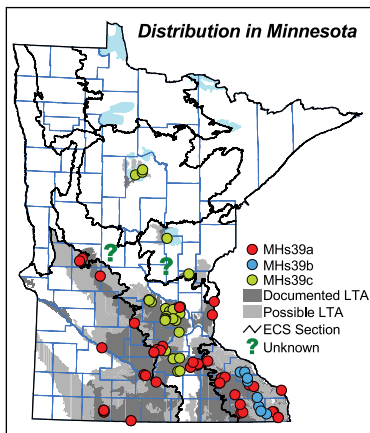
Southern Mesic Maple-Basswood Forest

Rich mesic hardwood forests on loamy soils derived from calcareous till or wind-deposited silt over bedrock. Present on sites that have been historically protected from fires on hummocky stagnation moraines, on till plains along rivers, and on middle or lower slopes of bedrock bluffs.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 110 plots (relevés).

- **Ground-layer** cover is interrupted to continuous (50–100%); important species include Virginia waterleaf (*Hydrophyllum virginianum*), bloodroot (*Sanguinaria canadensis*), yellow violet (*Viola pubescens*), large-flowered bellwort (*Uvularia grandiflora*), wild leek (*Allium tricoccum*), blue cohosh (*Caulophyllum thalictroides*), and early meadow-rue (*Thalictrum dioicum*). Spring ephemeral species such as cut-leaved toothwort (*Cardamine concatenata*) and Dutchman's breeches (*Dicentra cucullaria*) are characteristic.
- **Shrub-layer** cover is rare to interrupted (5–75%); common species include sugar maple, bitternut hickory, basswood, prickly gooseberry (*Ribes cynosbati*), and chokecherry (*Prunus virginiana*).
- **Subcanopy** cover is most commonly patchy to interrupted (25–75%); important species include sugar maple, ironwood, basswood, and bitternut hickory.
- **Canopy** cover is interrupted to continuous (50–100%) and strongly dominated by sugar maple, with basswood, northern red oak, and occasionally red elm and American elm. Bur oak replaces northern red oak in importance in the CGP.



Landscape Setting & Soils

- **Stagnation moraines**—Occasional. Present on rolling to hummocky topography with complex slopes. Parent material is strongly calcareous till with little gravel and few stones. Soil surface is loamy and dark colored to about 10in (25cm), indicating former occupation of these sites by oak or aspen woodland. Soils have a very thick clay-loam subsoil horizon, but there is no indication that it perches or retains water for long periods of time. Gray soil colors and deposits of free carbonates are common below the clay-loam horizon, indicating availability of water and nutrients below the clay layer. Soils are well drained. Soil-moisture regime is fresh or very fresh. (Big Woods, Hardwood Hills, and Oak Savanna in MIM; localized along large lakes in MDL and WSU)
- **Till plains**—Common. Present on rolling topography, with most occurrences on north aspects. Parent material is strongly calcareous, fine-textured till with little gravel and few stones. Soil surface is loamy and dark to about 10in (25cm), indicating former occupation of these sites by oak or aspen woodland. Soils have a very thick clay-loam subsoil horizon but there is no indication that it perches or retains water for long periods of time. Gray soil colors and deposits of free carbonates are common below the clay-loam horizon, indicating availability of water and nutrients below the clay layer. Soils are well drained. Soil-moisture regime is fresh or very fresh. (Big Woods, Hardwood Hills, and Oak Savanna in MIM; localized along large lakes in MDL and WSU; localized along river valleys in CGP)
- **Loess-covered or drift-covered bedrock bluffs**—Occasional. Most often present on middle and lower slopes with strong affinity for north and northeast aspects. Parent material is wind-deposited silt that is generally deeper than 60in (150cm) over sedimentary bedrock. Flagstone-sized rocks are common just above the bedrock. Soils have dark, organic-rich surface horizons, indicating former occupation of these sites



by oak woodland or prairie. Little clay is available for development of subsoil horizons capable of perching snowmelt and rainfall. Soils are well drained. Soil moisture regime is fresh. (Blufflands in PPL; MIM)

Natural History

In the past, catastrophic disturbances were rare in MHs39. An analysis of Public Land Survey records indicates the rotation of catastrophic fires was in excess of 1,000 years, and the rotation of catastrophic windthrow was about 680 years.¹ Events that result in partial loss of trees, especially light surface fires, were more common, with an estimated rotation of about 50 years. Based on the historic composition and age structure of these forests, MHs39 had two growth stages separated by a period of transition.

- **0–35 years**—Young forests recovering from wind or fire, dominated by northern red oak mixed with basswood, quaking aspen, and some American elm.
- **35–75 years**—A transition period marked by the gradual decline of northern red oak and its replacement by sugar maple. Basswood declines slightly, and quaking aspen is essentially eliminated during this stage. American elm and ironwood increase, and white oak seedlings become established during this period.
- **> 75 years**—Mature forests mostly of sugar maple mixed evenly with basswood, American elm, ironwood, and northern red oak, and with some white oak in the eastern part of the range of the community.

Similar Native Plant Community Classes

● MHs38 Southern Mesic Oak-Basswood Forest

MHs38 and MHs39 are very similar, and the ranges of the two classes overlap strongly. MHs38 lacks the spring ephemeral species often present in the herbaceous layer of MHs39 and also is less likely to have large patches of wood nettle (*Laportea canadensis*).

MHs39 Indicator Species	(freq%)	
	MHs39	MHs38
False rue anemone (<i>Enemion bitematum</i>)	25	2
Dutchman's breeches (<i>Dicentra cucullaria</i>)	44	5
Cut-leaved toothwort (<i>Cardamine concatenata</i>)	36	4
White trout lily (<i>Erythronium albidum</i>)	30	4
Blue phlox (<i>Phlox divaricata</i>)	36	5
Puttyroot (<i>Aplectrum nyemale</i>)	15	3
Ostrich fern (<i>Matteuccia struthiopteris</i>)	15	3
Stemless blue violets (<i>Viola</i> spp.)*	38	11

*Stemless blue violets (*Viola sororia* and similar *Viola* spp.)

MHs38 Indicator Species	(freq%)	
	MHs39	MHs38
Northern bedstraw (<i>Galium boreale</i>)	-	23
Poison ivy (<i>Toxicodendron rydbergii</i>)	2	57
Paper birch (C)	2	20
Canada mayflower (<i>Maianthemum canadense</i>)	4	37
Columbine (<i>Aquilegia canadensis</i>)	5	30
Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	7	47
Wild sarsaparilla (<i>Aralia nudicaulis</i>)	15	54
Wild grape (<i>Vitis riparia</i>)	12	39

● MHs49 Southern Wet-Mesic Hardwood Forest

The range of MHs49 overlaps with MHs39 in the southeastern and south-central part of the state, where MHs49 occurs on wet-mesic, level silty alluvium or glacial till. Species adapted to high water tables or species common on heavy, moist soil are common in MHs49. Spring ephemerals are often abundant in both classes.

MHs39 Indicator Species	(freq%)	
	MHs39	MHs49
Northern red oak (C,U)	55	13
Lady fern (<i>Athyrium filix-femina</i>)	55	13
Hairy Solomon's seal (<i>Polygonatum pubescens</i>)	22	5
Rattlesnake fern (<i>Botrychium virginianum</i>)	41	10
Red baneberry (<i>Actaea rubra</i>)	30	8
Early meadow-rue (<i>Thalictrum dioicum</i>)	67	18
Wood anemone (<i>Anemone quinquefolia</i>)	45	13
Nodding trillium (<i>Trillium cernuum</i>)	25	8

*Appendaged waterleaf (*Hydrophyllum appendiculatum*)

MHs49 Indicator Species	(freq%)	
	MHs39	MHs49
Rock elm (C,U)	1	23
Appendaged waterleaf*	2	21
Stinging nettle (<i>Urtica dioica</i>)	5	46
Hackberry (C)	7	51
Hawthorn (<i>Crataegus</i> spp.)	6	33
Nannyberry (<i>Viburnum lentago</i>)	8	36
Tall coneflower (<i>Rudbeckia laciniata</i>)	10	38
Ambiguous sedge (<i>Carex amphibola</i>)	8	28

● MHC36 Central Mesic Hardwood Forest (Eastern)

The range of MHC36 overlaps with MHs39 through the central part of Minnesota. MHC36 tends to lack the spring ephemeral species present in the herbaceous layer of MHs39.

¹Forested communities that extend into the prairie regions of Minnesota tend to have shorter rotations of disturbance from fire (and often wind) on the western edge of their range compared with the eastern part. This probably results from drier climate in the west and being surrounded by prairie vegetation that burns frequently. Because estimated rotations of disturbance for forested communities are calculated from PLS bearing-tree records across the range of the community, and records in the prairie regions are often much sparser than those to the east, disturbance rotations may be much shorter for forest stands in the prairie regions than those presented for the class as a whole.



MHs39 Indicator Species	(freq%)	
	MHs39	MHs36
Dutchman's breeches (<i>Dicentra cucullaria</i>)	41	-
Cut-leaved toothwort (<i>Cardamine concatenata</i>)	30	-
Blue phlox (<i>Phlox divaricata</i>)	36	1
Missouri gooseberry (<i>Ribes missouriense</i>)	28	2
Hackberry (U)	35	2
Cleavers (<i>Galium aparine</i>)	66	5
Wood nettle (<i>Laportea canadensis</i>)	63	8
Stemless blue violets (<i>Viola</i> spp.)*	39	6

*Stemless blue violets (*Viola sororia* and similar *Viola* spp.)

MHs36 Indicator Species	(freq%)	
	MHs39	MHs36
Large-leaved aster (<i>Aster macrophyllus</i>)	-	77
Rose twistedstalk (<i>Streptopus roseus</i>)	1	56
Pale bellwort (<i>Uvularia sessilifolia</i>)	1	54
Red maple (C,U)	1	50
Round-lobed hepatica (<i>Anemone americana</i>)	2	61
Mountain rice grass (<i>Oryzopsis asperifolia</i>)	2	60
Beaked hazelnut (<i>Corylus cornuta</i>)	3	62
Canada mayflower (<i>Maianthemum canadense</i>)	4	51

Native Plant Community Types in Class

• MHs39a Sugar Maple - Basswood - (Bitternut Hickory) Forest

Rich mesic hardwood forests on moderate to steep north-facing slopes on hummocky stagnation moraines, on till plains along the Minnesota River, and on middle and lower slopes on bedrock bluffs. Most often, canopy is strongly dominated by sugar maple with lesser amounts of basswood and, often, northern red oak or bur oak. Ironwood and sugar maple are the most abundant subcanopy species. Sugar maple is also common in the shrub layer with bitternut hickory, prickly gooseberry, chokecherry, and pagoda dogwood (*Cornus alternifolia*). MHs39a is the most widespread of the three community types in MHs39. MHs39a is less likely than MHs39b to have abundant spring ephemerals in the ground layer where the ranges of the two community types overlap in the PPL and is less likely than MHs39c to have abundant wood nettle in the ground layer where the ranges of these two types overlap in the Big Woods Subsection of the MIM. Documented in the PPL, MIM, and CGP. Description is based on summary of vegetation data from 62 plots.

• MHs39b Sugar Maple - Basswood - Red Oak - (Blue Beech) Forest

Rich mesic hardwood forests on shady, moist, middle and lower parts of moderate to steep north-facing slopes. Canopy is strongly dominated by sugar maple, with basswood and northern red oak. Ironwood, blue beech, sugar maple, basswood, and bitternut hickory are the most abundant subcanopy species. These same species are also common in the shrub layer with bladdernut (*Staphylea trifolia*), pagoda dogwood, and leatherwood (*Dirca palustris*). Species that help to differentiate MHs39b from the other types in this class include blue beech (*Carpinus caroliniana*) in the canopy and understory, and bladdernut, Wood's sedge (*Carex woodii*), woodland millet grass (*Milium effusum*), shining bedstraw (*Galium concinnum*), mayapple (*Podophyllum peltatum*), bulblet fern (*Cystopteris bulbifera*), interrupted fern (*Osmunda claytoniana*), Virginia spring beauty (*Claytonia virginica*), two-leaved miterwort (*Mitella diphylla*), and hispid buttercup (*Ranunculus hispidus*) in the understory. MHs39b has very high species diversity and provides important habitat for a variety of rare plant species. Restricted to the PPL. Description is based on summary of vegetation data from 10 plots.

• MHs39c Sugar Maple Forest (Big Woods)

Rich mesic hardwood forests on gently sloping sites on hummocky stagnation moraines and also on till plains along the Minnesota River. Canopy is strongly dominated by sugar maple, often with basswood and less frequently with northern red oak, red elm, or American elm. Sugar maple is also abundant in the subcanopy and shrub layer. Other common species in the shrub layer are basswood, bitternut hickory, prickly gooseberry, red-berried elder (*Sambucus racemosa*), and chokecherry. MHs39c has been documented mainly in the Big Woods Subsection of the MIM, where it may overlap with MHs39a. Species that help to differentiate MHs39c in this area include hackberry (especially when present in the canopy), red-berried elder, puttyroot (*Aplectrum hyemale*), giant Solomon's seal (*Polygonatum biflorum*), and hairy Solomon's seal (*Polygonatum pubescens*). MHs39c is also more likely to have dense patches of wood nettle in the ground layer. Documented in the MIM with occasional occurrences in the WSU and MDL. Description is based on summary of vegetation data from 38 plots.



MN DNR

Wolsfeld Woods Scientific and Natural Area, Hennepin County, MN



MHs39 Southern Mesic Maple-Basswood Forest — Species Frequency and Cover

freq% cover

freq% cover

Forbs, Ferns & Fern Allies

Virginia waterleaf (<i>Hydrophyllum virginianum</i>)	85	•••
Bloodroot (<i>Sanguinaria canadensis</i>)	85	•
Yellow violet (<i>Viola pubescens</i>)	77	•
Large-flowered bellwort (<i>Uvularia grandiflora</i>)	75	•
Wild leek (<i>Allium tricoccum</i>)	74	•
Blue cohosh (<i>Caulophyllum thalictroides</i>)	72	•
Early meadow-rue (<i>Thalictrum dioicum</i>)	67	•
Cleavers (<i>Galium aparine</i>)	66	•
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	66	•
Zigzag goldenrod (<i>Solidago flexicaulis</i>)	60	•
Jack-in-the-pulpit (<i>Arisaema thiphyllum</i>)	60	•
Wood nettle (<i>Laportea canadensis</i>)	59	•••
Lady fern (<i>Athyrium filix-femina</i>)	55	•
Common false Solomon's seal (<i>Smilacina racemosa</i>)	53	•
Wild ginger (<i>Asarum canadense</i>)	52	••
Common anemone's nightshade (<i>Circaea luteiflora</i>)	49	•
Sharp-lobed hepatica (<i>Anemone acutiloba</i>)	47	•
Maidenhair fern (<i>Adiantum pedatum</i>)	45	•
Wood anemone (<i>Anemone quinquefolia</i>)	45	•
Erect, Smooth, or Illinois carillon-flower*	44	•
Dutchman's breeches (<i>Dicentra cucullaria</i>)	44	•
Rattlesnake fern (<i>Botrychium virginianum</i>)	41	•
White avens (<i>Geum canadense</i>)	41	•
Kidney-leaved buttercup (<i>Ranunculus abortivus</i>)	40	•
Honewort (<i>Cryptotaenia canadensis</i>)	40	•
Stemless blue violets (<i>Viola sororia</i> and similar <i>Viola</i> spp.)	38	•
Blue phlox (<i>Phlox divaricata</i>)	36	•
Cut-leaved toothwort (<i>Cardamine concatenata</i>)	36	••
Wild geranium (<i>Geranium maculatum</i>)	35	•
White trout lily (<i>Erythronium albidum</i>)	30	•••
Red bareberry (<i>Actaea rubra</i>)	30	•
Lopseed (<i>Phytolmia leptostachya</i>)	29	•
Touch-me-not (<i>Impatiens</i> spp.)	28	•
Drooping trillium (<i>Trillium flexipes</i>)	27	•

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

Grasses & Sedges

Woody Vines

Shrubs

Trees

	freq%	cover	freq%	cover	freq%	cover	freq%	cover
Sweet-scented bedstraw (<i>Galium triflorum</i>)	26	•						
Two-leaved miterwort (<i>Mitella diphylla</i>)	25	•						
False rue anemone (<i>Emmenanthe bidentata</i>)	25	••						
Nodding trillium (<i>Trillium cernuum</i>)	25	•						
Gregarious black snakeroot (<i>Sanicle gregaria</i>)	22	•						
Hairy Solomon's seal (<i>Polygonatum pubescens</i>)	22	•						
Pennsylvania sedge (<i>Carex pensylvanica</i>)	34	•						
Starry sedge (<i>Carex rosea</i>)	27	•						
Long-stalked sedge (<i>Carex pedunculata</i>)	27	•						
Bland sedge (<i>Carex blanda</i>)	26	•						
Bottlebrush grass (<i>Elymus hystrix</i>)	25	•						
Virginia creeper (<i>Parthenocissus</i> spp.)	50	•						
Canada moonseed (<i>Menispermum canadense</i>)	25	•						
Prickly gooseberry (<i>Ribes cynosbati</i>)	81	•						
Chokecherry (<i>Prunus virginiana</i>)	58	•						
Pagoda dogwood (<i>Cornus alternifolia</i>)	45	•						
Prickly ash (<i>Zanthoxylum americanum</i>)	31	•						
Missouri gooseberry (<i>Ribes missouriense</i>)	28	••						
Red-berried elder (<i>Sambucus racemosa</i>)	27	•						
Sugar maple	91	••••	87	••••	88	•••		
Basswood	90	••••	46	•	57	•		
Northern red oak	55	•••	-	-	37	•		
Red elm	35	••	20	••	33	••		
American elm	35	••	18	•	22	•		
Ironwood	35	•	67	•••	39	•		
Bitternut hickory	25	••	31	••	75	•		
Black ash	25	•	12	•	18	•		
Green ash	16	••	-	-	28	•		
Blue beech	-	-	15	•••	15	••		