



Central Mesic Hardwood Forest (Western)

Mesic hardwood forests dominated most commonly by basswood and sugar maple. Present on well-drained loamy soils on rolling to hummocky stagnation moraines.

Vegetation Structure & Composition

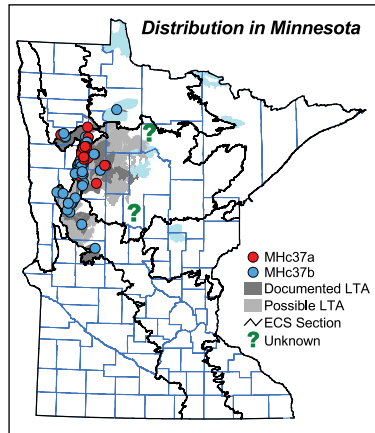
Description is based on summary of vegetation data from 107 plots (relevés).

- **Ground-layer** cover is variable, with large-flowered bellwort (*Uvularia grandiflora*) and Pennsylvania sedge (*Carex pennsylvanica*) the most important species. Other common species include early meadow-rue (*Thalictrum dioicum*), zigzag goldenrod (*Solidago flexicaulis*), wild sarsaparilla (*Aralia nudicaulis*), yellow violet (*Viola pubescens*), and rattlesnake fern (*Botrychium virginianum*). Overall, ground-layer species richness is considerably lower than in other central and southern mesic hardwood forest classes in Minnesota.

- **Shrub layer** is typically interrupted to continuous (50–100% cover), with abundant sugar maple saplings. Ironwood, chokecherry (*Prunus virginiana*), and leatherwood (*Dirca palustris*) are also common.

- **Subcanopy** is patchy to continuous (25–100% cover) and dominated by sugar maple, often with ironwood and basswood.

- **Canopy** is interrupted to continuous (50–100% cover), dominated most commonly by sugar maple and basswood, often with paper birch and less frequently with quaking aspen, northern red oak, bur oak, American elm, or ironwood. Occasionally, the canopy is dominated by northern red oak or quaking aspen.



Landscape Setting & Soils

- **Stagnation moraines**—Common. Landscape is rolling to very hummocky, with variable relief. Parent material is calcareous, loamy till with modest amounts of gravel. Free carbonates are present below 20–30in (50–75cm). Surface horizons are dark, indicating the past presence of prairie or brushland vegetation. Soils have firm, clay-loam subsoil horizons capable of perching snowmelt and rainfall, but there are no soil colors indicative of prolonged saturation. Soils are well drained. Soil-moisture regime is fresh or very fresh. (Hardwood Hills in MIM; Agassiz Lowlands [Ponemah Point only] in MOP; Chippewa Plains and Pine Moraines & Outwash Plains in MDL)

Natural History

In the past, catastrophic disturbances were rare in MHc37. An analysis of Public Land Survey records indicates that the rotation of catastrophic fires was about 515 years, and the rotation of catastrophic windthrow was in excess of 1,000 years. Events that result in partial loss of the tree canopy, especially light surface fires, were much more common, with an estimated rotation of about 70 years. Based on the historic composition and age structure of these forests, MHc37 had three growth stages.

- **0–55 years**—Young forests recovering from fire, dominated by quaking aspen mixed with paper birch, American elm, basswood, red oak, and sugar maple.

- **55–135 years**—Mature forests consisting of sugar maple mixed with many other trees, including old quaking aspen, paper birch, American elm, basswood, some bur oak, and minor amounts of white spruce.

- **> 135 years**—Old forests similar in composition to mature forests but with less sugar maple and more white spruce. (Although white spruce was not recorded in samples from modern forests, its range in Minnesota overlaps at least partially with the range of MHc37. White



spruce may be absent from modern samples because of bias in plot placement; it is also possible that white spruce was more important in the community in the past.)

Similar Native Plant Community Classes

• MHc36 Central Mesic Hardwood Forest (Eastern)

MHc36 is similar to MHc37 but is most common to the east, in the WSU and in the southern half of the Hardwood Hills Subsection in the MIM. In general, MHc36 is considerably richer in species than MHc37.

MHc37 Indicator Species	(freq%)	
	MHc37	MHc36
Canada goldenrod (<i>Solidago canadensis</i>)	12	1
Box elder (U)	8	1
Tall coneflower (<i>Rudbeckia laciniata</i>)	22	4
Round-leaved dogwood (<i>Cornus rugosa</i>)	17	5
American hazelnut (<i>Corylus americana</i>)	37	12
American elm (C,U)	73	25
Quaking aspen (C,U)	47	20
Paper birch (C,U)	65	31

MHc36 Indicator Species	(freq%)	
	MHc37	MHc36
Blue beech (U)	-	40
Bitternut hickory (U)	-	34
Wild geranium (<i>Geranium maculatum</i>)	1	52
Interrupted fern (<i>Osmunda claytoniana</i>)	1	45
Nodding fescue (<i>Festuca subverticillata</i>)	2	47
Bearded shortspur (<i>Brachyelytrum erectum</i>)	5	41
Large-flowered trillium (<i>Trillium grandiflorum</i>)	7	52
Red maple (C,U)	7	50

• MHc26 Central Dry-Mesic Oak-Aspen Forest

MHc26 can be similar to MHc37; although MHc26 is most common to the east of MHc37, the ranges of the two classes overlap in the northern MIM and in the western MDL.

MHc37 Indicator Species	(freq%)	
	MHc37	MHc26
Tall coneflower (<i>Rudbeckia laciniata</i>)	22	1
Blue cohosh (<i>Caulophyllum thalictroides</i>)	37	3
Wild ginger (<i>Asarum canadense</i>)	33	4
Bloodroot (<i>Sanguinaria canadensis</i>)	48	7
American elm (C,U)	73	11
Lopseed (<i>Phryma leptostachya</i>)	50	9
Botlebrush grass (<i>Elymus hystrix</i>)	22	4
Leatherwood (<i>Dirca palustris</i>)	68	17

MHc26 Indicator Species	(freq%)	
	MHc37	MHc26
Lowbush blueberry (<i>Vaccinium angustifolium</i>)	-	43
Starflower (<i>Trientalis borealis</i>)	-	34
Tall blackberries*	-	27
Bluebead lily (<i>Clintonia borealis</i>)	1	27
Interrupted fern (<i>Osmunda claytoniana</i>)	1	25
Red maple (C,U)	7	83
Fly honeysuckle (<i>Lonicera canadensis</i>)	3	32
Bush honeysuckle (<i>Diervilla lonicera</i>)	15	65

* Tall blackberries (*Rubus allegheniensis* and similar *Rubus* spp.)

• FDs36 Southern Dry-Mesic Oak-Aspen Forest

FDs36 is similar to MHc37 mainly when bur oak or aspen are important in the canopy of MHc37 (MHc37a). The two classes have overlapping ranges in the northern part of the MIM.

MHc37 Indicator Species	(freq%)	
	MHc37	FDs36
Black ash (U)	32	-
Large-leaved aster (<i>Aster macrophyllus</i>)	29	-
Long-stalked sedge (<i>Carex pedunculata</i>)	16	-
Sugar maple (C,U)	84	8
Leatherwood (<i>Dirca palustris</i>)	53	8
Wild ginger (<i>Asarum canadense</i>)	58	12
Rose twistedstalk (<i>Streptopus roseus</i>)	53	12
Northern red oak (C,U)	68	24

FDs36 Indicator Species	(freq%)	
	MHc37	FDs36
Golden alexanders (<i>Zizia aurea</i>)	-	28
Wild grape (<i>Vitis riparia</i>)	-	24
Gray dogwood (<i>Cornus racemosa</i>)	8	72
Snowberry or Wolfberry*	8	68
Red raspberry (<i>Rubus idaeus</i>)	8	36
Tall meadow-rue (<i>Thalictrum dasycarpum</i>)	8	28
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	8	24
Columbine (<i>Aquilegia canadensis</i>)	13	40

* Snowberry or Wolfberry (*Symphoricarpos albus* or *S. occidentalis*)

• FDs37 Southern Dry-Mesic Oak (Maple) Woodland

FDs37 is similar to MHc37 mainly when MHc37 is dominated by bur oak, quaking aspen, or northern red oak (MHc37a).

MHc37 Indicator Species	(freq%)	
	MHc37	FDs37
Wild ginger (<i>Asarum canadense</i>)	58	2
Leatherwood (<i>Dirca palustris</i>)	53	2
Tall coneflower (<i>Rudbeckia laciniata</i>)	42	2
Sugar maple (C,U)	84	4
Zigzag goldenrod (<i>Solidago flexicaulis</i>)	89	7
Round-lobed hepatica (<i>Anemone americana</i>)	63	7
Rose twistedstalk (<i>Streptopus roseus</i>)	53	7
Basswood (C,U)	84	27

FDs37 Indicator Species	(freq%)	
	MHc37	FDs37
Wild grape (<i>Vitis riparia</i>)	-	62
Northern pin oak (C,U)	-	60
Tall blackberries*	-	53
White oak (C)	-	29
Wild geranium (<i>Geranium maculatum</i>)	3	71
Red maple (C,U)	8	67
Gray dogwood (<i>Cornus racemosa</i>)	8	67
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	8	60

* Tall blackberries (*Rubus allegheniensis* and similar *Rubus* spp.)

• MHn35 Northern Mesic Hardwood Forest

MHn35 is similar to MHc37, although the two classes overlap geographically only in the extreme western MDL and in the northern part of the Hardwood Hills Subsection in the MIM.



MHc37 Indicator Species	(freq%)	
	MHc37	MHn35
Lopseed (<i>Phryma leptostachya</i>)	50	1
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	25	1
Bloodroot (<i>Sanguinaria canadensis</i>)	48	4
Blue cohosh (<i>Caulophyllum thalictroides</i>)	37	4
Bottlebrush grass (<i>Elymus hystrix</i>)	22	3
American hazelnut (<i>Corylus americana</i>)	37	6
Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	30	7
American elm (C.U)	73	17

* Groundpine (*Lycopodium dendroideum* or *L. hickeyi*)

MHn35 Indicator Species	(freq%)	
	MHc37	MHn35
Starflower (<i>Trientalis borealis</i>)	-	61
Groundpine*	-	36
Hairy honeysuckle (<i>Lonicera hirsuta</i>)	-	24
Bluebead lily (<i>Clintonia borealis</i>)	1	71
Fly honeysuckle (<i>Lonicera canadensis</i>)	3	62
Red maple (C.U)	7	64
Bearded shorthusk (<i>Brachyelytrum erectum</i>)	5	35
Balsam fir (U)	8	51

Native Plant Community Types in Class

• MHc37a Aspen - (Sugar Maple - Basswood) Forest

Mesic hardwood forests dominated by basswood, quaking aspen, or northern red oak, often with a significant component of sugar maple, bur oak, and American elm. Paper birch is often present in the canopy but seldom abundant. Sugar maple is often abundant in the understory, with lesser amounts of basswood, ironwood, and American elm. Species that help to distinguish MHc37a from MHc37b include bur oak in the canopy, downy arrowwood (*Viburnum rafinesquianum*), Canada mayflower (*Maianthemum canadense*), common strawberry (*Fragaria virginiana*), dwarf raspberry (*Rubus pubescens*), wild ginger (*Asarum canadense*), erect, smooth, or Illinois carrion-flower (*Smilax ecirrata*, *S. herbacea*, or *S. illinoensis*), and bracken (*Pteridium aquilinum*). Although less common, other species more likely to be present in MHc37a are black cherry saplings, bush honeysuckle (*Diervilla lonicera*), spreading dogbane (*Apocynum androsaemifolium*), Canada goldenrod (*Solidago canadensis*), and starry false Solomon's seal (*Smilacina stellata*). MHc37a has been documented in the northern half of the Hardwood Hills Subsection in the MIM and in the extreme western MDL. Description is based on summary of vegetation data from 38 plots.

• MHc37b Sugar Maple - Basswood - (Aspen) Forest

Mesic hardwood forests dominated by sugar maple and basswood, often with some paper birch and occasionally with northern red oak or quaking aspen in the canopy. American elm and bur oak may also be present, although these species are less common than in MHc37a. Sugar maple is abundant in the understory, with lesser amounts of ironwood, basswood, American elm, or northern red oak. Leatherwood (*Dirca palustris*) and pagoda dogwood (*Cornus alternifolia*) are characteristic in the shrub layer. When present, common enchanter's nightshade (*Circaea lutetiana*), hairy Solomon's seal (*Polygonatum pubescens*), and giant Solomon's seal (*Polygonatum biflorum*) help to differentiate MHc37b from MHc37a. MHc37b has been documented in the Hardwood Hills Subsection of the MIM and in the extreme western MDL. Description is based on summary of vegetation data from 69 plots.



photo by T.J. Whitfield, MN DNR

Hubbard County, MN



MHC37 Central Mesic Hardwood Forest (Western) – Species Frequency & Cover

	freq%	cover	freq%	cover
Forbs, Ferns & Fern Allies				
Early meadow-rue (<i>Thalictrum dioicum</i>)	96	••		
Large-flowered bellwort (<i>Uvularia grandiflora</i>)	95	•••		
Zigzag goldenrod (<i>Solidago flexicaulis</i>)	86	•••		
Wild sarsaparilla (<i>Aralia nudicaulis</i>)	83	•		
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	75	•		
Yellow violet (<i>Viola pubescens</i>)	70	•		
Rattlesnake fern (<i>Bostrychium virginianum</i>)	68	•		
Round-lobed hepatica (<i>Anemone americana</i>)	62	•		
Maryland black snakeroot (<i>Sanicula marilandica</i>)	54	•		
Wood anemone (<i>Anemone quinquefolia</i>)	51	•		
Lopseed (<i>Phytolaba leptostachya</i>)	50	•		
Bloodroot (<i>Sanguinaria canadensis</i>)	48	•		
Common false Solomon's seal (<i>Smilacina racemosa</i>)	47	•		
Rose twistedstalk (<i>Streptopus roseus</i>)	43	•		
Sweet-scented bedstraw (<i>Galium triflorum</i>)	41	•		
Red baneberry (<i>Actaea rubra</i>)	39	•		
American spikenard (<i>Aralia racemosa</i>)	38	•		
Hog peanut (<i>Amphicarpaea bracteata</i>)	38	•		
Blue cohosh (<i>Caulophyllum thalictroides</i>)	37	•		
Canada mayflower (<i>Maianthemum canadense</i>)	33	•		
Wild ginger (<i>Asarum canadense</i>)	33	•		
Lindley's aster (<i>Aster ciliolatus</i>)	32	•		
Erect, Smooth, or Illinois carrion-flower*	31	•		
Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	30	•		
Dwarf raspberry (<i>Rubus pubescens</i>)	29	••		
Common strawberry (<i>Fragaria virginiana</i>)	26	•		
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	25	•		
Yellow lady's slipper (<i>Cypripedium calceolus</i>)	24	•		
Bracken (<i>Pteridium aquilinum</i>)	24	••		
Large-leaved aster (<i>Aster macrophyllus</i>)	23	•		
Tall coneflower (<i>Rudbeckia laciniata</i>)	22	•		
Lady fern (<i>Athyrium filix-femina</i>)	22	•		
Pale bellwort (<i>Uvularia sessilifolia</i>)	22	•		
Viney pea (<i>Lathyrus venosus</i>)	17	•		
Trees				
Pale vetchling (<i>Lathyrus ochroleucus</i>)				17
Spreading dogbane (<i>Apocynum androsaemifolium</i>)				16
Hairy Solomon's seal (<i>Polygonatum pubescens</i>)				15
Grasses & Sedges				
Pennsylvania sedge (<i>Carex pensylvanica</i>)				87
Mountain rice grass (<i>Oryzopsis asperifolia</i>)				77
Bottlebrush grass (<i>Elymus hystrix</i>)				22
Long-stalked sedge (<i>Carex pedunculata</i>)				18
Climbing Plants				
Virginia creeper (<i>Parthenocissus</i> spp.)				22
Shrubs				
Leatherwood (<i>Dirca palustris</i>)				68
Chokecherry (<i>Prunus virginiana</i>)				65
Prickly gooseberry (<i>Ribes cynosbati</i>)				63
Pagoda dogwood (<i>Cornus alternifolia</i>)				63
Downy arrowwood (<i>Viburnum rafinesquianum</i>)				55
Beaked hazelnut (<i>Corylus cornuta</i>)				49
Juneberries (<i>Amelanchier</i> spp.)				45
American hazelnut (<i>Corylus americana</i>)				37
Poison ivy (<i>Toxicodendron rydbergii</i>)				23
Prickly ash (<i>Zanthoxylum americanum</i>)				19
Round-leaved dogwood (<i>Cornus rugosa</i>)				17
Shrub Layer				
Basswood	88	•••	63	••
Sugar maple	79	••••	85	••••
Paper birch	65	•	22	•
Quaking aspen	47	••	23	•
Northern red oak	44	•••	18	•
Bur oak	39	•••	17	•
American elm	30	•	40	•
Ironwood	16	•••	71	••
Green ash	12	•	14	•

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