



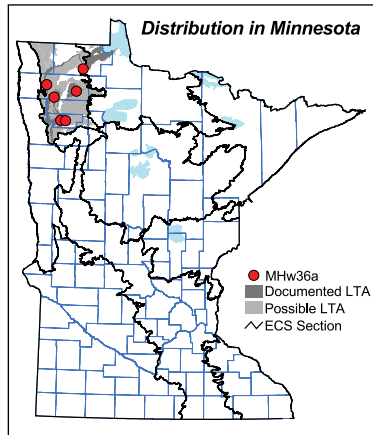
Northwestern Wet-Mesic Hardwood Forest

Wet-mesic hardwood forests on somewhat poorly drained, fire-protected sites on alluvial deposits along rivers draining the Glacial Lake Agassiz plain and on broad flats associated with shoreline features of Glacial Lake Agassiz.

Vegetation Structure & Composition

Description is based on summary of vegetation data from 6 plots (relevés).

- **Ground-layer** cover is typically patchy (25–50%). Common species include Canada mayflower (*Maianthemum canadense*), Maryland black snakeroot (*Sanicula marilandica*), sweet-scented bedstraw (*Galium triflorum*), spreading dogbane (*Apocynum androsaemifolium*), dwarf raspberry (*Rubus pubescens*), red baneberry (*Actaea rubra*), nodding trillium (*Trillium cernuum*), and Pennsylvania sedge (*Carex pennsylvanica*).
- **Shrub-layer** cover is patchy to interrupted (25–75%). The most common species are junoberries (*Amelanchier* spp.), downy arrowwood (*Viburnum rafinesquianum*), gray dogwood (*Cornus racemosa*), highbush cranberry (*Viburnum trilobum*), beaked hazelnut (*Corylus cornuta*), American elm, bur oak, and quaking aspen, with beaked hazelnut and gray dogwood often abundant.
- **Subcanopy** cover is sparse (5–25%), with occasional green ash, box elder, American elm, quaking aspen, bur oak, or balsam poplar.
- **Canopy** cover is interrupted to continuous (50–100%). The most common species are quaking aspen, bur oak, American elm, green ash, and basswood.



Landscape Setting & Soils

- **Alluvial deposits**—Common. Present on alluvial soils along rivers draining the Glacial Lake Agassiz plain. Parent material is stoneless silt or very fine sand that has been leached of carbonates to depths greater than 50in (125cm). Sites are rarely flooded and soils have gray colors that indicate a stable high water table at about 24in (60cm) below the ground surface. Soils are moderately well drained to somewhat poorly drained, and the soil-moisture regime is moist to very moist. (LAP)
- **Beach deposits**—Occasional. Present on broad flats associated with shoreline features of Glacial Lake Agassiz. Parent material is calcareous, fine-sandy deposits that have some gravel and no stones. Soil surface is dark and organic-rich to about 20in (50cm). Beneath are gray-colored sands that are saturated for most of the growing season. Carbonates are concentrated in the upper horizons by evaporation and transpiration. Soils are somewhat poorly drained, and the soil-moisture regime is very moist. (LAP)

Natural History

In the past, catastrophic disturbances were rare in MHw36. MHw36 tends to occur in sites protected from fire, such as river valleys, and analysis of Public Land Survey records indicates that catastrophic fires were very uncommon in the community, with a rotation of about 570 years. Catastrophic windthrow was also uncommon, with a rotation of about 370 years. Events that result in partial loss of trees, especially light surface fires, were much more common, with an estimated rotation of just 12 years.

The Public Land Survey records show almost no change in tree species composition among age classes of the community. Young, mature, and old forests were all



dominated by quaking aspen and bur oak. Forests younger than about 55 years were richer in quaking aspen, and forests older than 55 years had more bur oak. Balsam poplar was a minor component of these forests and was most abundant in forests 55–75 years old. American elm was a minor component most evident in older stands. Basswood, cottonwood, black ash, and green ash are important components in modern mature forests but were very rarely mentioned in the historical records. The increased importance of these species may be the result of a decrease in fire frequency in the landscape caused by agricultural fragmentation and a century of fire suppression.

Similar Native Plant Community Classes

● FDw34 Northwestern Mesic Aspen-Oak Woodland

FDw34 can be similar to MHw36 when woodland species are important in the understory of FDw34 (FDw34b). Bur oak and quaking aspen are common in the canopy in both communities, but MHw36 appears more likely to also have abundant American elm, green ash, and basswood, which are rare in FDw34. The ranges of the two communities overlap in the LAP, where FDw34 generally occurs on flat, sandy sites on the Glacial Lake Agassiz plain, while MHw36 is present on river bottoms or on broad flats associated with shoreline features of Glacial Lake Agassiz.

MHw36 Indicator Species	(freq%)		FDw34 Indicator Species	(freq%)	
	MHw36	FDw34		MHw36	FDw34
Nodding trillium (<i>Trillium cernuum</i>)	83	-	American vetch (<i>Vicia americana</i>)	-	100
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	67	-	Bastard toadflax (<i>Comandra umbellata</i>)	-	57
Lopseed (<i>Phryma leptostachya</i>)	67	-	Bebb's willow (<i>Salix bebbiana</i>)	-	57
Balsam poplar (C,U)	50	-	Bluejoint (<i>Calamagrostis canadensis</i>)	-	43
Early meadow-rue (<i>Thalictrum dioicum</i>)	50	-	White rattlesnakeroot (<i>Prenanthes alba</i>)	-	43
Tall coneflower (<i>Rudbeckia laciniata</i>)	50	-	Pin cherry (<i>Prunus pensylvanica</i>)	-	43
Green ash (C,U)	83	14	Prickly wild, Smooth wild, or Woods' rose*	17	100
American elm (C,U)	83	14	American hazelnut (<i>Corylus americana</i>)	17	71

*Prickly wild, Smooth wild, or Woods' rose (*Rosa acicularis*, *R. blanda*, or *R. woodsii*)

● FDw44 Northwestern Wet-Mesic Aspen Woodland

FDw44, like MHw36, frequently has abundant quaking aspen in the canopy. FDw44, however, is more likely to also have significant cover of balsam poplar or white spruce, while MHw36 is likely to have significant cover of bur oak, American elm, or basswood. The ranges of the two classes overlap in the LAP, where FDw44 occurs on flat, sandy sites on the Glacial Lake Agassiz plain, while MHw36 is present on river bottoms or on broad flats associated with shoreline features of Glacial Lake Agassiz.

MHw36 Indicator Species	(freq%)		FDw44 Indicator Species	(freq%)	
	MHw36	FDw44		MHw36	FDw44
Basswood (C,U)	33	-	American vetch (<i>Vicia americana</i>)	-	67
Common enchanter's nightshade (<i>Circaea lutetiana</i>)	33	-	Dwarf alder (<i>Rhamnus alnifolia</i>)	-	58
Common false Solomon's seal*	33	-	Bluejoint (<i>Calamagrostis canadensis</i>)	-	58
Giant Solomon's seal (<i>Polygonatum biflorum</i>)	33	-	Bebb's willow (<i>Salix bebbiana</i>)	-	52
Lopseed (<i>Phryma leptostachya</i>)	67	3	Fringed loosestrife (<i>Lysimachia ciliata</i>)	-	48
Box elder (C,U)	67	6	Swamp thistle (<i>Cirsium muticum</i>)	-	33
Virginia creeper (<i>Parthenocissus</i> spp.)	50	6	Prickly or Smooth wild rose**	17	82
Tall coneflower (<i>Rudbeckia laciniata</i>)	50	6	American hazelnut (<i>Corylus americana</i>)	17	70

*Common false Solomon's seal (*Smilacina racemosa*) **Prickly or Smooth wild rose (*Rosa acicularis* or *R. blanda*)

● WFw54 Northwestern Wet Aspen Forest

WFw54 can be similar to MHw36, and the ranges of the two classes overlap in the LAP. Both communities tend to have abundant quaking aspen in the canopy, but WFw54 is more likely to also have black ash, black spruce, or tamarack in the canopy, while MHw36 is more likely to have bur oak and basswood. WFw54 generally occurs in wet depressions and on poorly drained, level to gently sloping lacustrine deposits on the Glacial Lake Agassiz plain; MHw36 occurs on river bottoms or on broad flats associated with shoreline features of Glacial Lake Agassiz.

MHw36 Indicator Species	(freq%)		WFw54 Indicator Species	(freq%)	
	MHw36	WFw54		MHw36	WFw54
Lopseed (<i>Phryma leptostachya</i>)	67	-	Bluejoint (<i>Calamagrostis canadensis</i>)	-	78
Virginia creeper (<i>Parthenocissus</i> spp.)	50	-	Dwarf alder (<i>Rhamnus alnifolia</i>)	-	74
Veiny meadow-rue (<i>Thalictrum venulosum</i>)	50	-	Palmate sweet coltsfoot (<i>Petasites frigidus</i>)	-	74
Basswood (C,U)	50	-	Naked miterwort (<i>Mitella nuda</i>)	-	63
Common false Solomon's seal*	33	-	Speckled alder (<i>Alnus incana</i>)	-	56
Giant Solomon's seal (<i>Polygonatum biflorum</i>)	33	-	Bebb's willow (<i>Salix bebbiana</i>)	-	44
Bur oak (C)	83	4	Swamp red currant (<i>Ribes triste</i>)	-	41
Green ash (C)	83	4	Bunchberry (<i>Cornus canadensis</i>)	-	37

*Common false Solomon's seal (*Smilacina racemosa*)



• MHC37 Central Mesic Hardwood Forest (Western)

MHC37 can be similar to MHw36 when it has abundant quaking aspen, bur oak, and basswood in the canopy (MHC37a). MHC37, however, is more likely to also have significant amounts of sugar maple and northern red oak, both of which appear to be absent from MHw36. MHC37 is present on well-drained loamy soils on rolling to hummocky stagnation moraines, while MHw36 occurs on somewhat poorly drained alluvial river bottoms or broad flats. The ranges of the two classes do not appear to overlap but border one another along the southern edge of the LAP.

MHw36 Indicator Species	(freq%)		MHC37 Indicator Species	(freq%)	
	MHw36	MHC37		MHw36	MHC37
Flat-topped aster (<i>Aster umbellatus</i>)	33	-	Large-flowered bellwort (<i>Uvularia grandiflora</i>)	-	100
Giant goldenrod (<i>Solidago gigantea</i>)	33	-	Zigzag goldenrod (<i>Solidago flexicaulis</i>)	-	90
Virginia thimbleweed (<i>Anemone virginiana</i>)	33	-	Sugar maple (C,U)	-	85
Veiny meadow-rue (<i>Thalictrum venulosum</i>)	50	3	Pagoda dogwood (<i>Cornus alternifolia</i>)	-	69
Balsam poplar (C,U)	50	5	Northern red oak (C,U)	-	67
Gray dogwood (<i>Cornus racemosa</i>)	67	8	Leatherwood (<i>Dicra palustris</i>)	-	54
Red raspberry (<i>Rubus idaeus</i>)	67	8	Black cherry (U)	-	28
Nodding trillium (<i>Trillium cernuum</i>)	83	13	Round-leaved dogwood (<i>Cornus rugosa</i>)	-	28

• FDs36 Southern Dry-Mesic Oak-Aspen Forest

FDs36, like MHw36, often has abundant bur oak and quaking aspen in the canopy but typically occurs on well-drained gravelly, loamy till on hummocky stagnation moraines rather than on alluvial river bottoms or on broad flats associated with shoreline features of Glacial Lake Agassiz. The ranges of the two classes do not appear to overlap but border one another along the southern edge of the LAP.

MHw36 Indicator Species	(freq%)		FDs36 Indicator Species	(freq%)	
	MHw36	FDs36		MHw36	FDs36
Balsam poplar (C,U)	67	-	Large-flowered bellwort (<i>Uvularia grandiflora</i>)	-	88
Veiny meadow-rue (<i>Thalictrum venulosum</i>)	50	-	Pointed-leaved tick trefoil (<i>Desmodium glutinosum</i>)	-	40
Virginia thimbleweed (<i>Anemone virginiana</i>)	33	-	Zigzag goldenrod (<i>Solidago flexicaulis</i>)	-	32
Giant Solomon's seal (<i>Polygonatum biflorum</i>)	33	-	Climbing bitterweed (<i>Celastrus scandens</i>)	-	28
Giant goldenrod (<i>Solidago gigantea</i>)	33	-	Northern red oak (U)	-	24
Nodding fescue (<i>Festuca subverticillata</i>)	33	-	Wild plum (<i>Prunus americana</i>)	-	24
Nodding trillium (<i>Trillium cernuum</i>)	83	12	Round-lobed hepatica (<i>Anemone americana</i>)	-	24
Veiny pea (<i>Lathyrus venosus</i>)	50	12	American hazelnut (<i>Corylus americana</i>)	17	68

• FFn57 Northern Terrace Forest

FFn57 often occurs along riparian corridors with MHw36. Both classes can have canopies with American elm, basswood, and green ash. FFn57 is present on sites that flood occasionally whereas MHw36 is present on sites that rarely flood.

MHw36 Indicator Species	(freq%)		FFn57 Indicator Species	(freq%)	
	MHw36	FFn57		MHw36	FFn57
Bur oak (<i>Quercus macrocarpa</i>) (C)	83	-	Jack-in-the-pulpit (<i>Arisaema triphyllum</i>)	-	50
Red raspberry (<i>Rubus idaeus</i>)	67	-	Canada moonseed (<i>Menispermum canadense</i>)	-	50
Veiny pea (<i>Lathyrus venosus</i>)	50	-	Assiniboine sedge (<i>Carex assiniboienensis</i>)	-	30
Bracken (<i>Pteridium aquilinum</i>)	50	-	Philadelphia fleabane (<i>Erigeron philadelphicus</i>)	-	30
Veiny meadow-rue (<i>Thalictrum venulosum</i>)	50	-	Virginia waterleaf (<i>Hydrophyllum virginianum</i>)	-	30
Flat-topped aster (<i>Aster umbellatus</i>)	33	-	Cut-leaved bugleweed (<i>Lycopus americanus</i>)	-	30
Juneberrries (<i>Amelanchier</i> spp.)	100	10	Wood nettle (<i>Laportea canadensis</i>)	17	70
Spreading dogbane (<i>Apocynum androsaemifolium</i>)	83	10	Ostrich fern (<i>Matteuccia struthiopteris</i>)	17	70

Native Plant Community Types in Class

• MHw36a Green Ash - Bur Oak - Elm Forest

MHw36a is the only plant community type recognized in this class, although the class is based on very few plot samples and could be divided into community types if more field data are collected in the future.

