



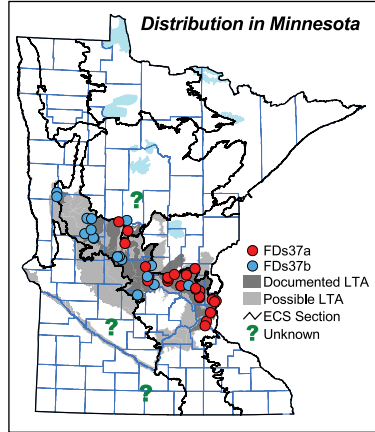
## Southern Dry-Mesic Oak (Maple) Woodland

Dry-mesic hardwood forests on undulating sand flats, hummocky moraines, and river bluffs. Present mostly on fine sand or sand-gravel soils. Often on south- or west-facing slopes but common also on flat to undulating sandy lake plains. Historically, fires were common in this community, and many stands are on sites occupied by brushlands 100–150 years ago.

### Vegetation Structure & Composition

Description is based on summary of vegetation data from 43 plots (relevés).

- **Ground-layer** cover is patchy to continuous (25–100%). Pointed-leaved tick trefoil (*Desmodium glutinosum*), Clayton's sweet cicely (*Osmorhiza claytonii*), hog peanut (*Amphicarpaea bracteata*), Canada mayflower (*Maianthemum canadense*), and wild geranium (*Geranium maculatum*) are commonly present. Pennsylvania sedge (*Carex pennsylvanica*) is the most abundant graminoid. Dewey's sedge (*Carex deweyana*) and starry sedge (*Carex rosea*) may also be present.
- **Shrub-layer** cover is patchy to continuous (25–100%). Common species include black cherry, red maple, chokecherry (*Prunus virginiana*), American hazelnut (*Corylus americana*), gray dogwood (*Cornus racemosa*), prickly ash (*Zanthoxylum americanum*), Virginia creeper (*Parthenocissus* spp.), and poison ivy (*Toxicodendron rydbergii*).
- **Subcanopy** cover is patchy to interrupted (25–75%). The most common species are black cherry, red maple, and bur oak.
- **Canopy** cover is usually interrupted to continuous (50–100%). Bur oak and northern pin oak are the most common species. Northern red oak, white oak, and red maple are occasionally present. Older trees are often open grown, indicating previously more open conditions on the site.
- **Note:** Red maple and white oak are generally absent from occurrences in the CGP.



### Landscape Setting & Soils

- **Glacial lake plains**—Common. Present on undulating sand flats that were deposited in the shallow waters of Glacial Lake Grantsburg. Parent material is stoneless, well-sorted fine sand. It was initially calcareous, but soils are now leached of carbonates. Subsoil horizons capable of perching snowmelt are lacking, but general fine-sand texture and occasional bands of silt and gravel can help to retain some soil moisture. Densely cemented layers of sand that may reflect past positions of the water table occur at depth and can help hold water for deeply rooted plants. Soils are excessively drained and the soil-moisture regime is moderately dry. (Anoka Sand Plain in MIM)
- **Stagnation moraines**—Occasional. Present on hummocky moraines, often adjacent to fire-prone outwash plains and tunnel valleys that were occupied in the past by brushland or prairie. Parent material is a discontinuous cap of partially sorted gravelly sand over a base of denser till and is often complexly stratified. Parent material can be calcareous or noncalcareous; when calcareous, soils are leached of free carbonates to at least 30in (75cm). Although some clays have accumulated in the subsoil, clays are insufficient to perch snowmelt and rainfall. The complex stratification allows these sites to retain some rainfall, and water is available to deeply rooted plants just above the dense till. Where the sandy cap is thick, the soils are excessively drained, and the soil-moisture regime is moderately dry. Where the cap is thinner, the soils are well drained, and the soil-moisture regime is fresh. (St. Paul-Baldwin Plains and Hardwood Hills in MIM; locally in Pine Moraines and Outwash Plains in MDL; and Minnesota River Prairie in CGP)



• **River bluffs**—Common. Present on steep (20–50%) south- or west-facing slopes along the Minnesota River valley and other major streams. Soils are developed on eroded calcareous till or cut-faces of gravelly terraces well above modern alluvium. Free carbonates are present at or close to the surface and topsoil layers are thin because of surface erosion. Soils are somewhat excessively to excessively drained. Soil moisture regime is dry to moderately fresh. (Minnesota River Prairie in CGP)

### Natural History

In the past, fires were very common throughout the range of FDs37. An analysis of Public Land Survey records indicates that the rotation of catastrophic fires was about 110 years, and the rotation of mild surface fires about 10 years.<sup>1</sup> The rotation of all fires combined is estimated to be 9 years. Windthrow was not common, with an estimated rotation exceeding 1,000 years. Based on the historic composition and age structure of these forests, FDs37 had two growth stages.

• **0–75 years**—Young forests recovering from fire, dominated by bur oak with some northern red oak or white oak. Quaking aspen, northern pin oak, and black cherry are minor components.

• **> 75 years**—Mature forests dominated by a mixture of bur oak, white oak, northern pin oak, and some northern red oak, with minor amounts of American elm. (In the past, sites now occupied by FDs37 typically supported more open communities, including brush-prairie or savanna. Air photos from the 1930s show these sites to have scattered oaks rather than forest canopies. With suppression of wildfires since the mid-1800s, these sites have developed denser tree canopies and herbs typical of mesic forests have become common in the understory. The examples of FDs37 used in this classification are best described by the mature forest growth stage.)

### Similar Native Plant Community Classes

#### • FDs36 Southern Dry-Mesic Oak-Aspen Forest

FDs36 can be similar to FDs37, and the ranges of the two communities overlap in the central part of the Hardwood Hills Subsection in the MIM and adjacent parts of the RRV. FDs36 tends to occur on loamy rather than fine sand or sand-gravel soils.

FDs37 Indicator Species	(freq%)	
	FDs37	FDs36
Northern pin oak (C.U)	60	-
Tall blackberries*	53	-
Large-leaved aster ( <i>Aster macrophyllus</i> )	51	-
Wild geranium ( <i>Geranium maculatum</i> )	71	4
Red maple (C.U)	67	4
Lady fern ( <i>Athyrium filix-femina</i> )	53	8
Black cherry (C.U)	87	16
Northern bedstraw ( <i>Gallium boreale</i> )	40	8

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

FDs36 Indicator Species	(freq%)	
	FDs37	FDs36
Canada goldenrod ( <i>Solidago canadensis</i> )	2	32
Tall coneflower ( <i>Rudbeckia laciniata</i> )	2	28
Golden alexanders ( <i>Zizia aurea</i> )	2	28
Basswood (C)	4	40
American Elm (C)	7	36
Large-flowered bellwort ( <i>Uvularia grandiflora</i> )	20	88
Lindley's aster ( <i>Aster ciliolatus</i> )	16	64
Bloodroot ( <i>Sanguinaria canadensis</i> )	9	32

#### • MHc26 Central Dry-Mesic Oak-Aspen Forest

MHc26 generally occurs to the north and east of FDs37, although the ranges of the two classes overlap along the border between the EBF and LMF Provinces. The presence of sugar maple, especially in the canopy, differentiates MHc26 from FDs37.

FDs37 Indicator Species	(freq%)	
	FDs37	MHc26
Box elder (U)	42	-
Prickly ash ( <i>Zanthoxylum americanum</i> )	67	4
Northern pin oak (C.U)	60	4
Black cherry (C)	29	3
Wild grape ( <i>Vitis riparia</i> )	62	7
Giant Solomon's seal ( <i>Polygonatum biflorum</i> )	27	4
Lopseed ( <i>Phryma leptostachya</i> )	62	9
Wild geranium ( <i>Geranium maculatum</i> )	71	13

MHc26 Indicator Species	(freq%)	
	FDs37	MHc26
Fly honeysuckle ( <i>Lonicera canadensis</i> )	-	32
Sugar maple (C.U)	4	71
Large-flowered trillium ( <i>Trillium grandiflorum</i> )	2	29
Bluebead lily ( <i>Clintonia borealis</i> )	2	27
Basswood (C)	4	45
Rose twistedstalk ( <i>Streptopus roseus</i> )	7	54
Round-lobed hepatica ( <i>Anemone americana</i> )	7	47
Pagoda dogwood ( <i>Cornus alternifolia</i> )	13	61

<sup>1</sup>Forested 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.



### • FDC34 Central Dry-Mesic Pine-Hardwood Forest

FDC34 generally occurs north of FDs37; the presence of conifers almost always distinguishes FDC34 from FDs37.

FDs37 Indicator Species	(freq%)		FDC34 Indicator Species	(freq%)	
	FDs37	FDC34		FDs37	FDC34
Prickly ash ( <i>Zanthoxylum americanum</i> )	67	-	Red pine (C)	-	51
Box elder (U)	42	-	Bunchberry ( <i>Cornus canadensis</i> )	-	39
Wild grape ( <i>Vitis riparia</i> )	62	2	Bluebead lily ( <i>Clintonia borealis</i> )	2	46
Lopseed ( <i>Phryma leptostachya</i> )	62	2	Rose twistedstalk ( <i>Streptopus roseus</i> )	7	68
Northern pin oak (C,U)	60	2	White pine (C,U)	4	41
Wild geranium ( <i>Geranium maculatum</i> )	71	3	Paper birch (U)	7	51
Common enchanter's nightshade ( <i>Circaea lutetiana</i> )	60	3	Round-lobed hepatica ( <i>Anemone americana</i> )	7	39
Pointed-leaved tick trefoil ( <i>Desmodium glutinosum</i> )	80	7	Lowbush blueberry ( <i>Vaccinium angustifolium</i> )	13	61

### • MHC36 Central Mesic Hardwood Forest (Eastern)

MHC36 can be similar to FDs37 when FDs37 is dominated by northern red oak (FDs37a). FDs37, however, generally lacks sugar maple, which is prominent in MHC36.

FDs37 Indicator Species	(freq%)		MHC36 Indicator Species	(freq%)	
	FDs37	MHC36		FDs37	MHC36
Northern pin oak (C,U)	50	2	Leatherwood ( <i>Dirca palustris</i> )	-	38
Prickly or Smooth wild rose*	27	2	Zigzag goldenrod ( <i>Solidago flexicaulis</i> )	4	79
Nannyberry ( <i>Viburnum lentago</i> )	46	4	Long-stalked sedge ( <i>Carex pedunculata</i> )	4	53
Black cherry (C)	38	4	Large-flowered trillium ( <i>Trillium grandiflorum</i> )	4	52
Gray dogwood ( <i>Cornus racemosa</i> )	62	7	Sugar maple (C,U)	8	91
Tall blackberries**	73	9	Basswood (C)	8	87
Wild grape ( <i>Vitis riparia</i> )	69	10	Blue beech (U)	4	40
American hazelnut ( <i>Corylus americana</i> )	85	12	Bloodroot ( <i>Sanguinaria canadensis</i> )	8	58

\*Prickly or Smooth wild rose (*Rosa acicularis* or *R. blanda*) \*\*Tall blackberries (*Rubus allegheniensis* and similar *Rubus* spp.)

### • MHS37 Southern Dry-Mesic Oak Forest

MHS37 can be similar to FDs37 but is more likely to occur on loamy soils (at least in the upper soil layers) than on fine sand or sand-gravel soils. MHS37 occurs on sites less affected by fire in the recent past and therefore generally lacks the open-grown canopy trees often present in FDs37.

FDs37 Indicator Species	(freq%)		MHS37 Indicator Species	(freq%)	
	FDs37	MHS37		FDs37	MHS37
Mountain rice grass ( <i>Oryzopsis asperifolia</i> )	42	-	Maidenhair fern ( <i>Adiantum pedatum</i> )	-	56
Large-leaved aster ( <i>Aster macrophyllus</i> )	51	2	Spreading Jacob's ladder ( <i>Polemonium reptans</i> )	-	47
Bush honeysuckle ( <i>Diervilla lonicera</i> )	36	2	Gregarious black snakeroot ( <i>Sanicula gregaria</i> )	4	58
Red maple (C,U)	67	7	Bitternut hickory (C,U)	4	56
Pale bellwort ( <i>Uvularia sessilifolia</i> )	62	7	Sugar maple (C,U)	4	51
Quaking aspen (C,U)	29	5	White snakeroot ( <i>Eupatorium rugosum</i> )	7	65
Spreading dogbane ( <i>Apocynum androsaemifolium</i> )	40	7	Hackberry (C,U)	9	60
Northern pin oak (C,U)	60	23	Honewort ( <i>Cryptotaenia canadensis</i> )	13	72

### • FDs27 Southern Dry-Mesic Pine-Oak Woodland

The range of FDs27 occasionally overlaps with FDs37 in the area around the Twin Cities, where it occurs on deep sands that accumulate along valley walls of tributaries to the Mississippi River.

FDs37 Indicator Species	(freq%)		FDs27 Indicator Species	(freq%)	
	FDs37	FDs27		FDs37	FDs27
Red maple (C,U)	67	-	Flowering spurge ( <i>Euphorbia corollata</i> )	-	62
Pale bellwort ( <i>Uvularia sessilifolia</i> )	62	-	Heart-leaved aster ( <i>Aster cordifolius</i> )	-	46
Large-leaved aster ( <i>Aster macrophyllus</i> )	51	-	Downy rattlesnake plantain ( <i>Goodyera pubescens</i> )	-	38
Mountain rice grass ( <i>Oryzopsis asperifolia</i> )	42	-	Bitternut hickory (C,U)	4	62
Beaked hazelnut ( <i>Corylus cornuta</i> )	24	-	Eastern red cedar (C,U)	4	62
Starflower ( <i>Trientalis borealis</i> )	22	-	White pine (C,U)	4	54
Downy arrowwood ( <i>Viburnum rafinesquianum</i> )	49	8	White snakeroot ( <i>Eupatorium rugosum</i> )	7	69
Nannyberry ( <i>Viburnum lentago</i> )	42	8	Black raspberry ( <i>Rubus occidentalis</i> )	9	54

### • FDC25 Central Dry Oak-Aspen (Pine) Woodland

The range of FDC25 overlaps with FDs37 in east-central Minnesota, where FDC25 occurs on level lake plains and on glacial river terraces. Species more commonly found in prairies are often present in FDC25 while generally absent from FDs37.



FDs37 Indicator Species	(freq%)	
	FDs37	FDc25
Box elder (U)	42	-
Common enchanter's nightshade ( <i>Circaea lutetiana</i> )	60	3
Prickly ash ( <i>Zanthoxylum americanum</i> )	67	7
Lopseed ( <i>Phryma leptostachya</i> )	62	7
Black cherry (C)	29	3
Lady fern ( <i>Athyrium filix-femina</i> )	53	7
Missouri gooseberry ( <i>Ribes missouriense</i> )	24	3
Wild geranium ( <i>Geranium maculatum</i> )	71	13

FDc25 Indicator Species	(freq%)	
	FDs37	FDc25
Wintergreen ( <i>Gaultheria procumbens</i> )	-	47
Wild bergamot ( <i>Monarda fistulosa</i> )	-	37
Jack pine (C)	-	30
Prairie willow ( <i>Salix humilis</i> )	-	30
Yarrow ( <i>Achillea millefolium</i> )	2	43
Big-toothed aspen (U)	4	33
Lowbush blueberry ( <i>Vaccinium angustifolium</i> )	13	93
Veiny pea ( <i>Lathyrus venosus</i> )	7	47

## Native Plant Community Types in Class

### • FDs37a Oak - (Red Maple) Woodland

Canopy is dominated by northern red oak, northern pin oak, and white oak with lesser amounts of bur oak and red maple. Red maple is also common in the subcanopy and shrub layers. Chokecherry, American hazelnut, gray dogwood, and prickly ash are common in the shrub layer. FDs37a is distinguished from FDs37b by the presence of northern red oak or white oak in the canopy or understory. Other species that can help to differentiate FDs37a from FDs37b include red maple, bush honeysuckle (*Diervilla lonicera*), lady fern (*Athyrium filix-femina*), interrupted fern (*Osmunda claytoniana*), and starflower (*Trientalis borealis*). FDs37a has been documented in the MIM and MDL; it is most common in the Anoka Sand Plain Subsection in the MIM. Description is based on summary of vegetation data from 26 plots.

### • FDs37b Pin Oak - Bur Oak Woodland

Canopy has abundant northern pin oak and bur oak. The subcanopy is not well differentiated from the canopy; bur oak, black cherry, and green ash are the most common subcanopy species. The shrub layer is often dense, with prickly ash, chokecherry, American hazelnut, gray dogwood, prickly gooseberry (*Ribes cynosbati*), and downy arrowwood (*Viburnum rafinesquianum*) all common. FDs37b is distinguished from FDs37a by the greater dominance of northern pin oak and bur oak in the canopy. Other species that help to differentiate FDs37b from FDs37a when present include green ash, wild honeysuckle (*Lonicera dioica*), snowberry or wolfberry (*Symphoricarpos* spp.), giant Solomon's seal (*Polygonatum biflorum*), Lindley's aster (*Aster ciliolatus*), and side-flowering aster (*Aster lateriflorus*). FDs37b has been documented in the MIM and CGP, where it is most common in the Hardwood Hills Subsection with occasional occurrences in the Anoka Sand Plain and Minnesota River Prairie Subsections. (Occurrences in the Minnesota River Prairie Subsection and other parts of southwestern Minnesota are included on the basis of field observations; few samples from FD communities are available for this part of the state.) Description is based on summary of vegetation data from 18 plots.



photo by D.S. Wovcha MN DNR



Boot Lake Scientific and Natural Area, Anoka County, MN



## FDS37 Southern Dry-Mesic Oak (Maple) Woodland — Species Frequency and Cover

	freq%	cover		freq%	cover		freq%	cover		freq%	cover
<b>Forbs, Ferns &amp; Fern Allies</b>											
Clayton's sweet cicely ( <i>Osmorhiza claytonii</i> )	78	••	Wild grape ( <i>Vitis riparia</i> )	62	•						
Pointed-leaved tick tetfoil ( <i>Desmodium glutinosum</i> )	78	•••	<b>Low Shrubs</b>								
Hog peanut ( <i>Ampelicarpea bracteata</i> )	76	•••	Red raspberry ( <i>Rubus idaeus</i> )	64	•						
Canada mayflower ( <i>Maianthemum canadense</i> )	73	••	Tall blackberries ( <i>Rubus allegheniensis</i> and similar <i>Rubus</i> spp.)	47	•						
Wild geranium ( <i>Geranium maculatum</i> )	69	•••	<b>Tall Shrubs</b>								
Common enchanter's nightshade ( <i>Circaea luteiflora</i> )	60	••	Chokeberry ( <i>Pyrus virginiana</i> )	82	•••						
Wild sarsaparilla ( <i>Aralia nudicaulis</i> )	60	••	American hazelnut ( <i>Corylus americana</i> )	80	•••						
Lopsseed ( <i>Phryma leptostachya</i> )	60	••	Gray dogwood ( <i>Cornus racemosa</i> )	67	•••						
Common false Solomon's seal ( <i>Smilacina racemosa</i> )	60	••	Prickly ash ( <i>Zanthoxylum americanum</i> )	67	•••						
Pale bellwort ( <i>Uvularia sessilifolia</i> )	60	•••	Poison Ivy ( <i>Toxicodendron rydbergii</i> )	64	••						
Lady fern ( <i>Athyrium filix-femina</i> )	51	••	Prickly gooseberry ( <i>Ribes cynosbati</i> )	49	••						
Bracken ( <i>Pteridium aquilinum</i> )	51	•••	Downy arrowwood ( <i>Viburnum rafinesquianum</i> )	49	••						
Sweet-scented bedstraw ( <i>Galium triflorum</i> )	49	••	Juneberries ( <i>Amelanchier</i> spp.)	47	••						
Large-leaved aster ( <i>Aster macrophyllus</i> )	49	•••	Nannyberry ( <i>Viburnum lentago</i> )	42	••						
Columbine ( <i>Aquilegia canadensis</i> )	40	••	Bush honeysuckle ( <i>Dierilla lonicera</i> )	33	••						
Northern bedstraw ( <i>Galium boreale</i> )	40	••	Missour gooseberry ( <i>Ribes missouriense</i> )	24	••						
Wood anemone ( <i>Anemone quinquefolia</i> )	40	••	Beaked hazelnut ( <i>Corylus cornuta</i> )	22	•••						
Spreading dogbane ( <i>Apocynum androsaemifolium</i> )	38	••	Snowberry or Wolfberry ( <i>Symphoricarpos albus</i> or <i>S. occidentalis</i> )	20	••						
Maryland black snakeroot ( <i>Saricula marilandica</i> )	36	••	Red-barked elder ( <i>Sambucus racemosa</i> )	20	••						
Early meadow-rue ( <i>Thalictrum dioicum</i> )	31	••	Round-leaved dogwood ( <i>Cornus rugosa</i> )	16	••						
Giant Solomon's seal ( <i>Polygonatum biflorum</i> )	27	••	<b>Trees</b>								
Starry false Solomon's seal ( <i>Smilacina stellata</i> )	22	••	Bur oak	67	•••	Canopy cover	58	••	Subcanopy cover	33	••
Starflower ( <i>Trientalis borealis</i> )	20	••	Northern pin oak	60	•••		33	•••		38	••
Interrupted fern ( <i>Osmunda claytoniana</i> )	20	••	Northern red oak	33	•••		13	•••		22	••
Large-flowered bellwort ( <i>Uvularia grandiflora</i> )	20	•••	White oak	29	•••		9	•••		18	••
Elliptic stinleaf ( <i>Pyrola elliptica</i> )	20	••	Black cherry	29	••		58	••		69	••
Tail-leaved aster ( <i>Aster sagittifolius</i> )	18	••	Quaking aspen	27	••		18	••		18	••
<b>Grasses &amp; Sedges</b>											
Pennsylvania sedge ( <i>Carex pensylvanica</i> )	84	••••	Red maple	27	••		56	•••		53	••
Mourain rice grass ( <i>Oryzopsis asperifolia</i> )	40	••	Paper birch	20	••		-	-		-	-
Nodding tescue ( <i>Festuca subverticillata</i> )	11	••	Big-toothed aspen	11	•••		-	-		-	-
Boottbrush grass ( <i>Elymus hystrix</i> )	11	••	Green ash	9	•••		31	••		36	••
<b>Woody Vines</b>											
Virginia creeper ( <i>Parthenocissus</i> spp.)	91	••	American elm	-	-		31	••		33	••
			Ironwood	-	-		29	•••		18	••