



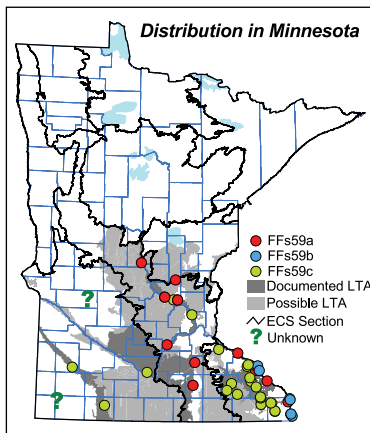
Southern Terrace Forest

Wet-mesic deciduous forests on silty or sandy alluvium on level, occasionally flooded sites along small streams to large rivers in the southern half of Minnesota.

Vegetation Structure & Composition

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

- **Ground-layer** cover is mostly interrupted to continuous (50–100%); often with abundant wood nettle (*Laportea canadensis*). Other typical species include Virginia waterleaf (*Hydrophyllum virginianum*), spotted touch-me-not (*Impatiens capensis*), tall coneflower (*Rudbeckia laciniata*), stinging nettle (*Urtica dioica*), cleavers (*Galium aparine*), common blue violet (*Viola sororia*), honewort (*Cryptotaenia canadensis*), aniseroot (*Osmorhiza longistylis*), Virginia bluebells (*Mertensia virginica*), and eastern narrowleaf sedge (*Carex grisea*). Reed canary grass (*Phalaris arundinacea*) is highly invasive on sites where the canopy has been opened by disturbance.
- **Woody vines** are sparse to patchy (5–50% cover), mostly present in lower strata; Virginia creeper (*Parthenocissus* spp.) and wild grape (*Vitis riparia*) are typical.
- **Shrub layer** and **subcanopy** are sparse to patchy (5–50% cover); typical species include American elm, hackberry, box elder, Missouri gooseberry (*Ribes missouriensis*), prickly ash (*Zanthoxylum americanum*), and chokecherry (*Prunus virginiana*).
- **Canopy** is interrupted to continuous (50–100% cover). Species composition is variable, but American elm, green ash, hackberry, basswood, box elder, silver maple, black ash, and cottonwood are often common. Swamp white oak is important in some stands in southeastern Minnesota.



Landscape Setting & Soils

- **Stream terraces**—Common. Topography is flat to undulating. Parent material is complexly stratified silty or fine sandy alluvium. The parent material may have been calcareous originally, but soils now lack free carbonates. Biogenic carbonates such as snail shells are occasionally preserved. Often, old soil surfaces rich in organic matter are present beneath newer alluvium deposited during floods. Gray soil colors occur within 30–60 in (75–150 cm) of the surface and indicate permanently saturated conditions below. Flooding occurs only in wet years or following major rains. Soil drainage is dependent on the height of the terrace above river level and ranges from moderately well drained on higher terraces to poorly drained on lower terraces. Soil-moisture regime is moist to very moist. (PPL; MIM except for northern Hardwood Hills; locally in CGP.)

Natural History

In the past, catastrophic disturbances were rare in FFs59. There are no references to fire in the Public Land Survey records, and the rotation of catastrophic windthrow was about 310 years. Events that result in partial loss of trees, especially flood damage (and possibly light surface fires), were much more common, with an estimated rotation of just 40 years. Based on the historic composition and age structure of these forests, FFs59 had three growth stages.

- **0–35 years**—Young forests recovering from severe flooding or wind, often dominated by elm (most often American elm, but red elm was present as well). Basswood, willows (*Salix amygdaloides* and *S. nigra*), and green ash are also present.



- **35–155 years**—Mature forests dominated by elm and ash, including American elm, red elm, green ash, and black ash. Basswood, bur oak, silver maple, hackberry, black walnut, and butternut are minor components. Willows are essentially absent.
- **> 155 years**—Old forests similar in composition to mature forests except walnuts, silver maple, and bur oak are more abundant, and basswood is mostly absent. (Although not present in historic records, swamp white oak occurs in some stands along the lower Mississippi River. Many of these trees are quite old, and it is likely that references to bur oak along the lower Mississippi River included the quite similar swamp white oak.)

Similar Native Plant Community Classes

• FFs68 Southern Floodplain Forest

FFs68 occurs along many of the same rivers as FFs59, and the two communities can grade into one another. FFs68 generally is present on sites that are inundated every spring (and sometimes following heavy rain) for several days to several weeks and have regular deposition of silt and sand, while FFn57 is present on sites—such as terraces and levees—that flood only occasionally and usually for just a few days at most. Recently deposited sediment, windrowed debris, and ice scars on trees are all useful evidence for distinguishing active floodplain sites from sites where terrace forests occur. The canopy of FFs68 is strongly dominated by silver maple, while FFs59 is more likely to have basswood, bur oak, swamp white oak, hackberry, black ash, or black walnut, with silver maple sometimes present but rarely dominant.

FFs59 Indicator Species	(freq%)	
	FFs59	FFs68
Missouri gooseberry (<i>Ribes missouriense</i>)	53	-
Aniseroot (<i>Osmorhiza longistylis</i>)	37	-
Chokecherry (<i>Prunus virginiana</i>)	33	-
Virginia waterleaf (<i>Hydrophyllum virginianum</i>)	70	4
Cleavers (<i>Galium aparine</i>)	51	4
White avens (<i>Geum canadense</i>)	40	4
Blue phlox (<i>Phlox divaricata</i>)	37	4
Basswood (C,U)	37	4

FFs68 Indicator Species	(freq%)	
	FFs59	FFs68
Bur marigold and Beggarticks (<i>Bidens</i> spp.)	5	44
Hop umbrella sedge (<i>Carex lupulina</i>)	2	22
Mad dog skullcap (<i>Scutellaria lateriflora</i>)	7	56
Wild cucumber (<i>Echinocystis lobata</i>)	2	19
Northern bugleweed (<i>Lycopus uniflorus</i>)	2	19
Rice cut grass (<i>Leersia oryzoides</i>)	7	30
False nettle (<i>Boehmeria cylindrica</i>)	7	26
Narrow-leaved hedge nettle (<i>Stachys tenuifolia</i>)	9	33

• FFn57 Northern Terrace Forest

FFn57 also occurs on terraces, levees, and other occasionally flooded sites along medium and large rivers, and is similar to FFs59 but is restricted to the northern half of the state. The ranges of the two communities overlap in east-central and west-central Minnesota.

FFs59 Indicator Species	(freq%)	
	FFs59	FFn57
Cleavers (<i>Galium aparine</i>)	51	-
Blue phlox (<i>Phlox divaricata</i>)	37	-
Missouri gooseberry (<i>Ribes missouriense</i>)	53	2
Aniseroot (<i>Osmorhiza longistylis</i>)	37	2
Virginia knotweed (<i>Polygonum virginianum</i>)	35	2
Cottonwood (C)	30	2
Hackberry (C,U)	65	8
Greenbrier (<i>Smilax tamnoides</i>)	47	8

FFn57 Indicator Species	(freq%)	
	FFs59	FFn57
Canada mayflower (<i>Maianthemum canadense</i>)	-	50
Graceful sedge (<i>Carex gracillima</i>)	-	48
Spotted water hemlock (<i>Cicuta maculata</i>)	-	40
Bladder sedge (<i>Carex intumescens</i>)	2	48
Pale bellwort (<i>Uvularia sessilifolia</i>)	2	42
Tall meadow-rue (<i>Thalictrum dasycarpum</i>)	5	67
Sensitive fern (<i>Onoclea sensibilis</i>)	9	63
Ostrich fern (<i>Matteuccia struthiopteris</i>)	16	79

• MHs49 Southern Wet-Mesic Hardwood Forest

MHs49 also occurs on silty alluvium on stream terraces but is more often restricted to narrow valleys along small streams in rugged, bedrock-controlled terrain. Both communities often have abundant spring ephemeral species such as false rue anemone (*Enemion biternatum*).

FFs59 Indicator Species	(freq%)	
	FFs59	MHs49
White grass (<i>Leersia virginica</i>)	23	-
Swamp white oak (C,U)	19	-
Ontario aster (<i>Aster ontariensis</i>)	26	3
Silver maple (C,U)	51	5
Virginia wild rye (<i>Elymus virginicus</i>)	44	5
Virginia knotweed (<i>Polygonum virginianum</i>)	35	5
Poison ivy (<i>Toxicodendron rydbergii</i>)	23	5
Cottonwood (C)	30	8

MHs49 Indicator Species	(freq%)	
	FFs59	MHs49
Zigzag goldenrod (<i>Solidago flexicaulis</i>)	-	46
Large-flowered bellwort (<i>Uvularia grandiflora</i>)	-	36
Ironwood (C,U)	2	56
Blue cohosh (<i>Caulophyllum thalictroides</i>)	7	64
Dutchman's breeches (<i>Dicentra cucullaria</i>)	7	46
White trout lily (<i>Erythronium albidum</i>)	7	44
Sugar maple (C,U)	14	69
Wild leek (<i>Allium tricoccum</i>)	12	56



• WF57 Southern Wet Ash Swamp

WF57 and FFs59 share much of their range, and both commonly occur on stream terraces, where they can grade into one another. Evidence of groundwater seepage, such as rivulets and saturated raised peat mounds, is almost always present in WF57 and absent from FFs59. The canopy of WF57 is usually dominated by black ash and generally lacks other species common in FFs59 such as hackberry, silver maple, box elder, swamp white oak, or cottonwood.

FFs59 Indicator Species	(freq%)	
	FFs59	WF57
Cottonwood (C)	31	-
Silver maple (C,U)	49	3
Greenbrier (<i>Smilax tamnoides</i>)	34	3
Ontario aster (<i>Aster ontariensis</i>)	29	3
Aniseroot (<i>Osmorhiza longistylis</i>)	46	6
Box elder (C)	66	10
Hackberry (C,U)	60	10
Woodmint (<i>Blephilia hirsuta</i>)	20	3

WF57 Indicator Species	(freq%)	
	FFs59	WF57
Fowl manna grass (<i>Glyceria striata</i>)	-	68
Awl-fruited sedge (<i>Carex stipata</i>)	-	52
Sensitive fern (<i>Onoclea sensibilis</i>)	-	48
Michigan lily (<i>Lilium michiganense</i>)	-	39
Dwarf raspberry (<i>Rubus pubescens</i>)	-	39
Skunk cabbage (<i>Symplocarpus foetidus</i>)	-	35
Common marsh marigold (<i>Caltha palustris</i>)	3	68
Lady fern (<i>Athyrium filix-femina</i>)	6	58

Native Plant Community Types in Class

• FFs59a Silver Maple - Green Ash - Cottonwood Terrace Forest

Present on terraces of medium to large rivers. The most common canopy trees are American elm, silver maple, box elder, and green ash, with occasional cottonwood and hackberry. Most of these species are also important in the understory. Important shrubs include wahoo (*Euonymus atropurpureus*), red-berried elder (*Sambucus racemosa*), hawthorns (*Crataegus* spp.), and prickly gooseberry (*Ribes cynosbati*). Important ground-layer species include Ontario aster (*Aster ontariensis*), jack-in-the-pulpit (*Arisaema triphyllum*), Maryland black snakeroot (*Sanicula marilandica*), Clayton's sweet cicely (*Osmorhiza claytonii*), early meadow-rue (*Thalictrum dioicum*), and virgin's bower (*Clematis virginiana*). Documented in the Blufflands Subsection in the PPL and in the Anoka Sand Plain and Oak Savanna Subsections in the MIM. Description is based on summary of vegetation data from 13 plots.

• FFs59b Swamp White Oak Terrace Forest

Present on terraces of the lower Mississippi River. Swamp white oak is diagnostic for this type, occurring in the canopy of all known examples and often in the understory as well. Other common canopy and understory trees are green ash, hackberry, silver maple, bitternut hickory, American elm, and basswood, with occasional cottonwood and river birch. Important shrubs include prickly ash, wild black currant (*Ribes americanum*), and gray dogwood (*Cornus racemosa*). Climbing poison ivy (*Toxicodendron radicans* var. *negundo*), greenbrier (*Smilax hispida*), wild grape (*Vitis riparia*), and Canada moonseed (*Menispermum canadense*) are important vining species. Important ground-layer species include Virginia knotweed, moneywort (*Lysimachia nummularia*), green dragon (*Arisaema dracontium*), sensitive fern (*Onoclea sensibilis*), rough bedstraw (*Galium asprellum*), obedient plant (*Physostegia virginiana*), false nettle (*Boehmeria cylindrica*), Virginia wild rye (*Elymus virginicus*), nodding fescue (*Festuca subverticillata*), Gray's sedge (*Carex grayi*), and muskingum sedge (*C. muskingumensis*). Restricted to the Blufflands Subsection in the PPL. Description is based on summary of vegetation data from 8 plots.

• FFs59c Elm - Ash - Basswood Terrace Forest

Present on terraces of small to large rivers. The most common canopy trees are American elm, box elder, basswood, black ash, and red elm, with occasional cottonwood, hackberry, silver maple, black maple, black walnut, and rock elm. Most of these are likewise important in the understory. Important shrubs include Missouri gooseberry and chokecherry. Important ground-layer species include Virginia waterleaf, cleavers, stinging nettle, aniseroot, blue phlox (*Phlox divaricata*), false rue anemone (*Enemion biternatum*), stemless blue violets, hispid buttercup (*Ranunculus hispidus*), Virginia bluebells, cow parsnip (*Heracleum lanatum*), mayapple (*Podophyllum peltatum*), and yellow trout lily (*Erythronium americanum*). Documented in the PPL, the Anoka Sand Plain Subsection in the MIM, and locally in the CGP. Description is based on summary of vegetation data from 22 plots.



photo by D.S. Wovcha MN DNR

Somerset Wildlife Management Area, Steele County, MN



FFs59 Southern Terrace Forest — Species Frequency & Cover

	freq%	cover		freq%	cover
Forbs, Ferns & Fern Allies					
Wood nettle (<i>Laportea canadensis</i>)	98	●●●●	Ambiguous sedge (<i>Carex amphibola</i>)	30	●●
Touch-me-not (<i>Impatiens</i> spp.)	77	●●	Bland sedge (<i>Carex blanda</i>)	30	●●
Virginia waterleaf (<i>Hydrophyllum virginianum</i>)	70	●●●●	Nodding fescue (<i>Festuca subverticillata</i>)	28	●●
Tall coneflower (<i>Rudbeckia laciniata</i>)	67	●●●	White grass (<i>Leersia virginica</i>)	23	●●
Singing nettle (<i>Urtica dioica</i>)	58	●●	Starry sedge (<i>Carex rosea</i>)	14	●●
Cleavers (<i>Galium aparine</i>)	51	●●●●	Gray's sedge (<i>Carex grayi</i>)	12	●●
Honewort (<i>Cryptotaenia canadensis</i>)	49	●●●	Woody Vines		
White avens (<i>Geum canadense</i>)	40	●●	Virginia creeper (<i>Parthenocissus</i> spp.)	53	●●
Aniseroot (<i>Osmorhiza longistylis</i>)	37	●●	Wild grape (<i>Vitis riparia</i>)	53	●●
Blue phlox (<i>Phlox divaricata</i>)	37	●●	Greenbrier (<i>Smilax tamnoides</i>)	47	●●
Virginia knotweed (<i>Polygonum virginianum</i>)	35	●●	Canada moonseed (<i>Menispermum canadense</i>)	33	●●
Stemless blue violets*	35	●●	Shrubs		
Erect, Smooth, or Illinois carrion-flower**	35	●●	Missouri gooseberry (<i>Ribes missouriense</i>)	53	●●
Jack-in-the-pulpit (<i>Arisaema triphyllum</i>)	33	●●	Prickly ash (<i>Zanthoxylum americanum</i>)	33	●●
Rugulose or Yellow violet (<i>Viola canadensis</i> or <i>V. pubescens</i>)	30	●●	Common elder (<i>Sambucus canadensis</i>)	33	●●
False rue anemone (<i>Enemion biternatum</i>)	30	●●	Chokecherry (<i>Prunus virginiana</i>)	33	●●●
Clearweed (<i>Pilea</i> spp.)	28	●●	Poison ivy (<i>Toxicodendron rydbergii</i>)	23	●●
Hispid buttercup (<i>Ranunculus hispidus</i>)	28	●●	Nannyberry (<i>Viburnum lentago</i>)	16	●●
Common chanter's nightshade (<i>Circaea luteiflora</i>)	26	●●	Prickly gooseberry (<i>Ribes cynosbati</i>)	16	●●
Ontario aster (<i>Aster ontariensis</i>)	26	●●	Hawthorn (<i>Crataegus</i> spp.)	14	●●
Gregarious black snakeroot (<i>Sanicula gregaria</i>)	23	●●	Trees		
Maryland black snakeroot (<i>Sanicula marilandica</i>)	23	●●		freq%	cover
Cow parsnip (<i>Heracleum lanatum</i>)	23	●●	American elm	65	●●●
Sweet-scented bedstraw (<i>Galium triflorum</i>)	21	●●●	Box elder	56	●●●
Clayton's sweet cicely (<i>Osmorhiza claytonii</i>)	19	●●●	Silver maple	51	●●●
Hog peanut (<i>Amphicarpaea bracteata</i>)	19	●●	Green ash	44	●●●
Woodmint (<i>Blephilia hirsuta</i>)	16	●●	Hackberry	40	●●●
Early meadow-rue (<i>Thalictrum dioicum</i>)	16	●●	Basswood	37	●●●
Starry false Solomon's seal (<i>Smilacina stellata</i>)	16	●●	Cottonwood	30	●●●
Virginia bluebells (<i>Mertensia virginica</i>)	16	●●●	Black ash	28	●●●
Ostrich fern (<i>Matteuccia struthiopteris</i>)	16	●●●	Red elm	26	●●●
Wild geranium (<i>Geranium maculatum</i>)	16	●●	Swamp white oak	19	●●●
Grasses & Sedges			Bitternut hickory	14	●●●
Virginia wild rye (<i>Elymus virginicus</i>)	44	●●	Black walnut	14	●●●

*Stemless blue violets (*Viola sororia* and similar *Viola* spp.) **Erect, Smooth, or Illinois carrion-flower (*Smilax ecirrata*, *S. herbacea*, or *S. illinoensis*)