



## Central Dry Pine Woodland

Dry-mesic pine woodlands on sandy, level to gently undulating outwash deposits. Crown fires and surface fires were common historically.

### Vegetation Structure & Composition

Description is based on summary of vegetation data from 37 plots (relevés).

- **Ground layer** is sparse to patchy (5-50% cover), composed mostly of dry woodland and shade-intolerant species. Pennsylvania sedge (*Carex pensylvanica*) is common and often abundant. Other frequent species include Canada mayflower (*Maianthemum canadense*), northern bedstraw (*Galium boreale*), common strawberry (*Fragaria virginiana*), yarrow (*Achillea millefolium*), and mountain rice grass (*Oryzopsis asperifolia*). Prairie grasses and forbs are also usually present, especially big bluestem (*Andropogon gerardii*) and hoary puccoon (*Lithospermum canescens*), with skyblue aster (*Aster oolentangiensis*), smooth blue aster (*A. laevis*), Virginia ground cherry (*Physalis virginiana*), oval-leaved milkweed (*Asclepias ovalifolia*), and alumroot (*Heuchera richardsonii*) less frequent.

- **Shrub layer** is patchy (25-50% cover), with American hazelnut (*Corylus americana*) common and often abundant. Other typical species in the tall-shrub layer are northern red oak and bur oak saplings, juneberries (*Amelanchier* spp.), and chokecherry (*Prunus virginiana*). Common low shrubs or half-shrubs include prickly or smooth wild rose (*Rosa acicularis/blanda*), prairie willow (*Salix humilis*), and lowbush blueberry (*Vaccinium angustifolium*).

- **Subcanopy** is poorly developed or absent.

- **Canopy** is interrupted to continuous (50-100% cover) and strongly dominated by jack pine with occasional quaking aspen, northern red oak, or red pine.

### Landscape Setting & Soils

- **Outwash plains and other flat, sandy landforms**—Common. Parent material is well-sorted sand, occasionally with lenses of gravel but lacking large stones. Originally the parent material was weakly calcareous, but free carbonates have been leached from the upper 60in (150cm). The soil surface is often dark in the upper 10in (25cm) because of incorporated organic matter, which indicates that some of these sites were formerly occupied by deciduous woodlands or prairies. Subsoil horizons that retain snowmelt or rainfall are absent. Soils are somewhat excessively drained. Soil-moisture regime is moderately dry. (Pine Moraines & Outwash Plains and Chippewa Plains in MDL; WSU)

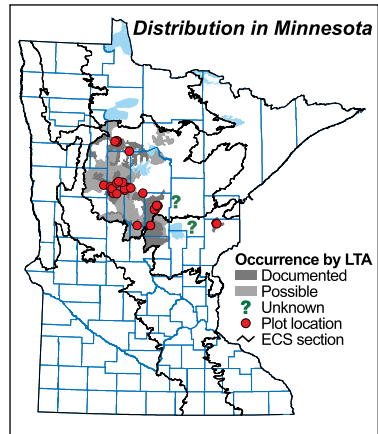
### Natural History

In the past, fires were very common throughout the range of FDC23. 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 30 years. The rotation of all fires combined is estimated to be 22 years. Windthrow was not common, with an estimated rotation exceeding 1,000 years. Based on the historic composition and age structure of these woodlands, FDC23 had three growth stages and one period of transition.

- **0-55 years**—Young woodlands recovering from fire, strongly dominated by jack pine with red pine as a minor component.

- **55-75 years**—A transition period marked by a partial decline in jack pine, mirrored by an increase in red pine. White pine seedlings become established.

- **75-155 years**—Mature woodlands dominated by jack pine mixed with red pine. The





understory and subcanopy typically contain several cohorts of red pine and jack pine, which become established following mild surface fires.

● **>155 years**—Old woodlands dominated by jack pine of several age classes, mixed with both red pine and white pine.

### **Similar Native Plant Community Classes**

#### ● **FDc12 Central Poor Dry Pine Woodland**

FDc12 is the most similar community class to FDc23. FDc12 is strongly dominated by jack pine and occurs on the same kinds of sandy, drought-prone landforms. FDc12, however, develops on sites that, while formerly prairie, have now been occupied by jack pine for about 3,000 years compared to about 1,000 years for FDc23. Because of this difference in length of presence of jack pine, the soils of FDc12 are lower in organic matter and nutrients, there are fewer deciduous shrubs and tree saplings in the understory, and broad-leaved evergreen species (which tend to be adapted to low-nutrient conditions) are abundant in the ground layer.

▶ **FDc12**—Lowbush blueberry and broad-leaved evergreen species such as wintergreen (*Gaultheria procumbens*) and bearberry (*Arctostaphylos uva-ursi*) are much more abundant in the ground layer.

▶ **FDc23**—Bur oak is more abundant in the canopy and understory, northern red oak is more abundant in the understory, American hazelnut and pin cherry (*Prunus pennsylvanica*) are more abundant in the shrub layer, and yarrow, Pennsylvania sedge, mountain rice grass, skyblue aster, and Virginia ground cherry are more common in the ground layer.

#### ● **FDc24 Central Rich Dry Pine Woodland**

FDc24 is similar to FDc23 but occurs on sites with a relatively short history (less than 700 years) of conifer cover. As a result, the soils of FDc24 are richer in nutrients than FDc23, with greater content of organic material in the upper layers.

▶ **FDc24**—Typically has denser tall-shrub layer (shrub cover is often >75%), with abundant beaked hazelnut (*Corylus cornuta*) in addition to American hazelnut.

▶ **FDc23**—Has greater presence of broad-leaved evergreen species such as bearberry, pipsissewa (*Chimaphila umbellata*), and wintergreen, which grow well in low-nutrient conditions. Yarrow, big bluestem, hoary puccoon, poverty grass (*Danthonia spicata*), harebell (*Campanula rotundifolia*), skyblue aster, and Virginia ground cherry are also much more common in FDc23.

#### ● **FDc25 Central Dry Oak-Aspen (Pine) Woodland**

FDc25 and FDc23 can appear similar when FDc25 is dominated by jack pine, although FDc25 generally occurs well to the south and east of FDc23 on sandy glacial river terraces and outwash deposits in the St. Croix Valley.

▶ **FDc25**—More likely to have northern pin oak in the canopy and understory, winterberry (*Ilex verticillata*) in the shrub layer, and little bluestem, upright bindweed (*Calystegia spithamea*), and woodland sunflower in the ground layer.

▶ **FDc23**—More likely to have hoary puccoon (*Lithospermum canescens*), bearberry (*Arctostaphylos uva-ursi*), pipsissewa (*Chimaphila umbellata*), smooth blue aster (*Aster laevis*), oval-leaved milkweed (*Asclepias ovalifolia*), and early meadow-rue in the ground layer.

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### **Native Plant Community Types in Class**

#### ● **FDc23a Jack Pine - (Yarrow) Woodland**

FDc23a is the only recognized community type in this class. It is divided into two subtypes:

##### ○ **FDc23a1 Ericaceous Shrub Subtype**

Canopy is strongly dominated by jack pine with occasional red pine and paper birch. Northern red oak is common in the tall-shrub layer. FDc23a1 differs from FDc23a2, the other subtype in FDc23a, by greater frequency of paper birch, cow wheat (*Melampyrum lineare*), starflower (*Trientalis borealis*), tessellated rattlesnake plantain (*Goodyera tessellata*), and large-leaved aster (*Aster macrophyllus*), and by greater abundance or frequency of broad-leaved evergreen species such as wintergreen, pipsissewa, and bearberry. Present mainly in the central part of MDL; may also occur in WSU. Description is based on summary of vegetation data from 18 plots.



○ FDC23a2 Bur Oak-Aspen Subtype

Canopy is strongly dominated by jack pine with occasional quaking aspen, northern red oak, and bur oak. Bur oak is common in the subcanopy and shrub layer. Species that help to differentiate FDC23a2 from FDC23a1 include bur oak (especially in the understory), early meadow-rue (*Thalictrum dioicum*), hawthorn (*Crataegus* spp.), quaking aspen, carrion-flowers (*Smilax ecirrata/herbacea/illinoensis* group), and Maryland black snakeroot (*Sanicula marilandica*). Present mainly in the western part of MDL. Description is based on summary of vegetation data from 19 plots.



photo by J.S. Boe MN DNR

Cass County, MN



### FDc23 Central Dry Pine Woodland – Species Frequency & Cover

	freq% cover	freq% cover	freq% cover
<b>Forbs, Ferns &amp; Fern Allies</b>			
Canada mayflower ( <i>Maianthemum canadense</i> )	100	•	•
Northern bedstraw ( <i>Galium boreale</i> )	96	•	•
Common strawberry ( <i>Fragaria virginiana</i> )	91	•	•
Yarrow ( <i>Achillea millefolium</i> )	84	•	•
Lindley's aster ( <i>Aster ciliolatus</i> )	79	•	•
Pale veitchling ( <i>Lathyrus ochroleucus</i> )	72	•	•
Spreading dogbane ( <i>Apocynum androsaemifolium</i> )	72	•	•
Hoary puccoon ( <i>Lithospermum canescens</i> )	72	•	•
Veiny pea ( <i>Lathyrus venosus</i> )	67	•	•
Wood anemone ( <i>Anemone quinquefolia</i> )	67	•	•
Field or Variable pushtoe ( <i>Antennaria neglecta</i> or <i>A. neodica</i> )	66	•	•
Harebell ( <i>Campanula rotundifolia</i> )	66	•	•
Hairy goldenrod ( <i>Solidago hispida</i> )	66	•	•
One-sided pyrola ( <i>Pyrola secunda</i> )	63	•	•
American vetch ( <i>Vicia americana</i> )	60	•	•
Skyblue aster ( <i>Aster coelestangensis</i> )	51	•	•
Smooth blue aster ( <i>Aster laevis</i> )	49	•	•
Early meadow-rue ( <i>Thalictrum dioicum</i> )	47	•	•
Bracken ( <i>Pteridium aquilinum</i> )	44	•••	•
Virginia ground cherry ( <i>Physalis virginiana</i> )	44	•	•
Oval-leaved milkweed ( <i>Asclepias ovalifolia</i> )	44	•	•
Balsam or Prairie ragwort ( <i>Senecio pauperculus</i> or <i>S. plattensis</i> )	42	•	•
Wild sarsaparilla ( <i>Aralia nudicaulis</i> )	37	•	•
Alumnoot ( <i>Heuchera richardsonii</i> )	37	•	•
Round-leaved pyrola ( <i>Pyrola rotundifolia</i> )	35	•	•
Starry false Solomon's seal ( <i>Smilacina stellata</i> )	33	•	•
Kalm's hawkweed ( <i>Hieracium kalmii</i> )	33	•	•
Erect, Smooth, or Illinois carrion-flower*	33	•	•
<b>Grasses &amp; Sedges</b>			
Pennsylvania sedge ( <i>Carex pensylvanica</i> )	93	••••	•
Mountain rice grass ( <i>Oryzopsis asperifolia</i> )	81	••	•
Poverty grass ( <i>Danthonia spicata</i> )	72	•	•
Big bluestem ( <i>Andropogon gerardii</i> )	70	••	•
False melic grass ( <i>Schizachne pumilus</i> )	70	•	•
<b>Slender wheatgrass (<i>Elymus trachycaulis</i>)</b>			
Clustered nutty grass ( <i>Muhlenbergia glomerata</i> )	49	•	•
Sharp-pointed rice grass ( <i>Oryzopsis pungens</i> )	44	•	•
Fringed or Kalm's brome ( <i>Bromus ciliatus</i> or <i>B. kalmii</i> )	38	•	•
<b>Low Shrubs</b>			
Lowbush blueberry ( <i>Vaccinium angustifolium</i> )	93	••	••
Pipsissewa ( <i>Chimaphila umbellata</i> )	65	••	••
Red raspberry ( <i>Rubus idaeus</i> )	63	••	••
Wintergreen ( <i>Gaultheria procumbens</i> )	58	•	•
Beaberry ( <i>Arctostaphylos uva-ursi</i> )	53	••	••
Tall blackberries ( <i>Rubus allegheniensis</i> and similar <i>Rubus</i> spp.)	42	•	•
<b>Shrubs</b>			
American hazelnut ( <i>Corylus americana</i> )	98	•••	•••
Prickly or Smooth wild rose ( <i>Rosa acicularis</i> or <i>R. blanda</i> )	98	••	••
Prairie willow ( <i>Salix humilis</i> )	91	•	•
Juneberreries ( <i>Amenanchier</i> spp.)	91	•	•
Chokeberry ( <i>Prunus virginiana</i> )	88	•	•
Snowberry or Wolfberry ( <i>Symphoricarpos albus</i> or <i>S. occidentalis</i> )	63	••	••
Poison ivy ( <i>Toxicodendron rydbergii</i> )	56	•	•
Pin cherry ( <i>Prunus pensylvanica</i> )	49	•	•
Beaked hazelnut ( <i>Corylus cornuta</i> )	37	••	••
Bush honeysuckle ( <i>Lonicera ioniceara</i> )	35	•	•
<b>Trees</b>			
	Canopy	Subcanopy	Shrub Layer
	freq% cover	freq% cover	freq% cover
Jack pine	98	•••••	47
Northern red oak**	23	••	79
Quaking aspen	21	••	51
Red pine	16	•	12
Bur oak	12	•••	60
Paper birch	9	••	23
Big-toothed aspen	7	•	12
Red maple	–	–	14
Black cherry	–	–	9
Balsam fir	–	–	7

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

\*\*Includes northern pin oak and hybrids between northern red oak and northern pin oak