



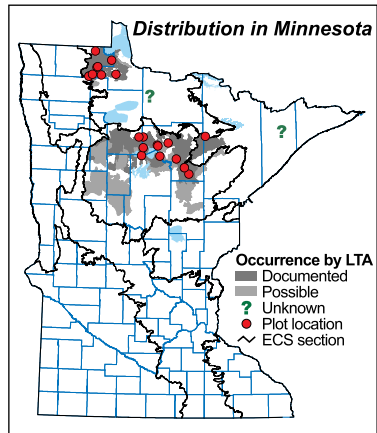
## Northern Dry-Sand Pine Woodland

Dry jack pine or red pine woodlands on level to gently undulating, sandy outwash or lake plains. Crown and surface fires were common historically.

### Vegetation Structure & Composition

Description is based on summary of vegetation data from 22 plots (relevés).

- **Ground-layer** plants are often interspersed with patches of lichens and bare soil. Bracken (*Pteridium aquilinum*), Canada mayflower (*Maianthemum canadense*), and mountain rice grass (*Oryzopsis asperifolia*) are usually the most abundant species. Broad-leaved evergreen ground-layer species such as pipsissewa (*Chimaphila umbellata*), wintergreen (*Gaultheria procumbens*), bearberry (*Arctostaphylos uva-ursi*), and trailing arbutus (*Epigaea repens*) are a common and characteristic feature of the community.
- **Shrub layer** is sparse to patchy (5-50% cover). Lowbush blueberry (*Vaccinium angustifolium*), junberries (*Amelanchier* spp.), wild roses (*Rosa* spp.), and beaked hazelnut (*Corylus cornuta*) are present in nearly all sites, while bush honeysuckle (*Diervilla lonicera*), when present, is abundant.
- **Subcanopy** is absent or poorly differentiated from the canopy.
- **Canopy** most commonly is interrupted (50-75% cover) but ranges from patchy to continuous (25-100%). Dominated by jack pine or red pine with occasional balsam fir and paper birch.



### Landscape Setting & Soils

- **Outwash plains**—Common. Landscape is level to rolling. Parent material is well-sorted sand, occasionally with lenses of gravel. Originally the parent material was calcareous, but free carbonates have been leached from the upper 60in (150cm). Subsoil horizons that can retain snowmelt or rainfall are absent, but fine textural banding is common between 40in-60in (100-150cm) deep and helps to retain some water. Soils are excessively to somewhat excessively drained. Soil-moisture regime is moderately dry. (Chippewa Plains, St. Louis Moraines, and Pine Moraines & Outwash Plains in MDL; Agassiz Lowlands in MOP)
- **Lake plains**—Common. Landscape is level. Parent material is very well-sorted, fine sandy lacustrine sediments lacking gravel or stones. Originally the parent material was calcareous, but free carbonates have been leached from the upper 60in (150cm). Distinctly gray upper horizons are typical, indicating a long history of conifer cover. Subsoil horizons that can retain snowmelt or rainfall are absent, but the overall landscape is clayey beneath the sand, and soils can be wet during snowmelt. Gray and bright soil colors indicate that the local water table is within the rooting zone in the spring and then falls to below 60in (150cm) early in the growing season. Soils are moderately well drained. Soil-moisture regime is moderately dry. (MOP, and Tamarack Lowlands in MDL)
- **Stagnation moraines**—Occasional. Present on flat, local deposits of sand and gravel within otherwise hummocky landscapes. Parent material is partially sorted sand with occasional lenses of gravel. Originally the parent material was calcareous, but free carbonates have been leached from the upper 30in (75cm). Distinctly gray upper horizons are typical, indicating a long history of conifer cover. Subsoil horizons that can retain snowmelt or rainfall are absent, but complex banding throughout the soil profile is common and helps to retain some water. Soils are somewhat excessively drained. Soil-moisture regime is moderately dry. (St. Louis Moraines and Chippewa Plains in MDL)



### Natural History

In the past, fires were common throughout the range of FDn12. An analysis of Public Land Survey records indicates that the rotation of catastrophic fires was about 170 years, and the rotation of moderate surface fires about 50 years. The rotation of all fires combined is estimated to be 42 years. Windthrow was not common, with an estimated rotation of 610 years. Based on the historic composition and age structure of these woodlands, FDn12 had three growth stages and one period of transition.

- **0-55 years**—Young woodlands recovering from fire (rarely wind), strongly dominated by jack pine mixed with some red pine and minor amounts of quaking aspen, paper birch, and white pine.

- **55-75 years**—A transition period marked by a precipitous decline in jack pine and its replacement by red pine and some white pine. Some white spruce seedlings become established during this period.

- **75-195 years**—Mature forests dominated by red pine. Cohorts of young red pine, white pine, and even some jack pine become established in the understory following surface fires. In unburned sites, white spruce, white pine, and paper birch are present in the understory.

- **>195 years**—Very old forests consisting of mixed canopy of red pine and white pine. Jack pine and red pine, or, alternatively, white spruce and paper birch, are present in the understory and subcanopy depending on the history of surface fires, which favor pines. (The persistence of jack pine in the historic records for old forests is surprising because jack pine seedlings and saplings are not common at present in mature and very old forests of the community. Apparently surface fires, which were more common in the past, were effective in keeping some jack pine in these forests as they matured.)

### Similar Native Plant Community Classes

- **FDn22 Northern Dry-Bedrock Pine (Oak) Woodland**

FDn22 and FDn12 are very similar in overall species composition. They differ mainly in substrate and site characteristics.

- ▶ **FDn22**—On shallow soils over bedrock. More likely to have northern pin oak in the canopy or understory; bush juniper (*Juniperus communis*), staghorn sumac (*Rhus hirta*), and smooth sumac (*R. glabra*) in the shrub layer; and common polypody (*Polypodium virginianum*), sweet fern (*Comptonia peregrina*), rock spikemoss (*Selaginella rupestris*), twin bentgrass (*Agrostis hyemalis*), and slender wheatgrass (*Elymus trachycaulus*) in the ground layer.

- ▶ **FDn12**—On sand deposits. More likely to have round-leaved pyrola (*Pyrola rotundifolia*), one-sided pyrola (*P. secunda*), smooth blue aster (*Aster laevis*), Lindley's aster (*A. ciliolatus*), wood anemone (*Anemone quinquefolia*), pipsissewa, and trailing arbutus in the ground layer.

- **FDn32 Northern Poor Dry-Mesic Mixed Woodland**

Similarity is greatest between jack pine-dominated stands of FDn32 on sand and jack pine-dominated stands of FDn12.

- ▶ **FDn32**—Canopy is diverse, with black spruce, balsam fir, white pine, paper birch, or quaking aspen often present in addition to jack pine or red pine. More likely to have black spruce in the subcanopy and groundpines (*Lycopodium dendroideum/hickeyi* group) in the ground layer.

- ▶ **FDn12**—Canopy is dominated by jack pine or red pine. More likely to have bur oak in the understory, chokecherry (*Prunus virginiana*) in the shrub layer, and winter-green in the ground layer.

- **FDc23 Central Dry Pine Woodland**

FDc23 occurs mainly to the west and south of FDn12, in the western half of MDL.

- ▶ **FDc23**—More likely to have prairie species such as big bluestem (*Andropogon gerardii*) and hoary puccoon (*Lithospermum canescens*) in the ground layer. American hazelnut (*Corylus americana*) is usually abundant in the shrub layer.

- ▶ **FDn12**—Beaked hazelnut is much more common than American hazelnut in the shrub layer.

**● FDC12 Central Poor Dry Pine Woodlands**

FDC12 occurs mainly to the west and south of FDn12, in the western half of MDL.

► **FDC12**—More likely to have prairie species such as balsam ragwort (*Senecio pauperculus*), two-flowered Cynthia (*Krigia biflora*), hoary puccoon, and big bluestem in the ground layer.

► **FDn12**—More likely to have abundant beaked hazelnut in the shrub layer, and abundant bracken (*Pteridium aquilinum*), wild sarsaparilla (*Aralia nudicaulis*), and mountain rice grass in the ground layer along with characteristically northern woodland and forest herbs such as twinflower (*Linnaea borealis*) and bluebead lily (*Clintonia borealis*).

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**Native Plant Community Types in Class****● FDn12a Jack Pine Woodland (Sand)**

Woodlands on sandy beach ridges and outwash deposits. Canopy is strongly dominated by jack pine, with 50-100% cover. Subcanopy and shrub layer are sparse. Bracken is sometimes abundant. Distinguished from FDn12b by the relative rarity of red pine in the canopy and rarity of understory species characteristic of forest habitats (see below). Documented primarily in MOP and MDL. Description is based on summary of vegetation data from 13 plots.

**● FDn12b Red Pine Woodland (Sand)**

Woodlands on sandy sites. Canopy is dominated by red pine, or by a mix of red pine and jack pine, with occasional white pine or paper birch. Balsam fir is common in the understory but not usually abundant. Beaked hazelnut and juneberries are common in the shrub layer. Ground layer has abundant blueberries. Distinguished from FDn12a by the presence of red pine in the canopy and by red pine and white pine in the understory. Also distinguished by the prevalence of understory species characteristic of forest (rather than woodland) habitats, including northern and wirey groundcedar (*Diphasiastrium complanatum-digitatum* group), pale vetchling (*Lathyrus ochroleucus*), starflower (*Trientalis borealis*), gaywings (*Polygala paucifolia*), and large-leaved aster (*Aster macrophyllus*). Documented in MOP, MDL, and the western edge of NSU. Description is based on summary of vegetation data from 9 plots.



Beaked hazelnut (*Corylus cornuta*)



### FDn12 Northern Dry-Sand Pine Woodland – Species Frequency & Cover

	freq% cover	freq% cover				
<b>Forbs, Ferns &amp; Fern Allies</b>						
Canada mayflower ( <i>Maianthemum canadense</i> )	96	•••				
Common strawberry ( <i>Fragaria virginiana</i> )	87	••				
Cow wheat ( <i>Melantherum lineare</i> )	83	••				
Wood anemone ( <i>Anemone quinquefolia</i> )	78	••				
Twinklifer ( <i>Ulmaceae borealis</i> )	78	•••				
Bracken ( <i>Pteridium aquilinum</i> )	74	••••				
Wild sarsaparilla ( <i>Aralia nudicaulis</i> )	74	•••				
Field or Variable pusspores ( <i>Antennaria neglecta</i> or <i>A. neglecta</i> )	57	••				
Sand or Dog violet ( <i>Viola adunca</i> or <i>V. conspersa</i> )	52	••				
Bluebead lily ( <i>Chilomena borealis</i> )	52	••				
Veiny pea ( <i>Lathyrus venosus</i> )	52	••				
Spreading dogbane ( <i>Apocynum androsaemifolium</i> )	48	••				
Northern or Wiry groundcedar ( <i>Diplasiastrium complanatum</i> or <i>D. digitatum</i> )	48	••				
Hairy goldenrod ( <i>Solidago hispida</i> )	48	••				
Round-leaved pyrola ( <i>Pyrola rotundifolia</i> )	43	••				
Lindley's aster ( <i>Aster ciliolatus</i> )	43	••				
Sweet-scented bedstraw ( <i>Galium triflorum</i> )	43	••				
Pale veitchling ( <i>Lathyrus ochroleucus</i> )	43	••				
One-sided pyrola ( <i>Pyrola secunda</i> )	39	••				
Bunchberry ( <i>Cornus canadensis</i> )	39	•••				
Dwarf raspberry ( <i>Rubus pubescens</i> )	39	••				
Northern bedstraw ( <i>Galium boreale</i> )	35	••				
Smooth blue aster ( <i>Aster laevis</i> )	35	••				
Kalm's hawkweed ( <i>Hieracium kalmii</i> )	35	••				
Green-flowered pyrola ( <i>Pyrola chlorantha</i> )	30	••				
Gaywings ( <i>Polygala paucifolia</i> )	30	•••				
Bastard toadflax ( <i>Comandra umbellata</i> )	30	••				
Starflower ( <i>Theridalis borealis</i> )	30	••				
Gray goldenrod ( <i>Solidago nemoralis</i> )	26	••				
Large-leaved aster ( <i>Aster macrophyllus</i> )	26	••••				
Tessellated rattlesnake plantain ( <i>Goodyera tessellata</i> )	26	••••				
Upright bindweed ( <i>Calyptroglia sphitamea</i> )	26	••				
<b>Grasses &amp; Sedges</b>						
Mountain rice grass ( <i>Oryzopsis asperifolia</i> )	87	••••				
<b>Trees</b>						
Jack pine	83	•••••	39	•••	22	••
Red pine	48	•••••	43	•••	22	••
Balsam fir	17	•••	39	•••	61	•••
Paper birch	17	•••	22	•••	26	••
Quaking aspen	13	••••	13	•••	22	••
White pine	13	•••	17	••	35	••
White spruce	13	••••	13	•••	17	••
Black spruce	9	•••	9	•••	9	••
Red maple	4	••••	13	•••	30	•••
Northern red oak	–	–	17	••	26	•••
Bur oak	–	–	9	••	39	•••
<b>Shrubs</b>						
Junberries ( <i>Amelanchier</i> spp.)					100	••
Prickly or Smooth wild rose ( <i>Rosa acicularis</i> or <i>R. blanda</i> )					96	••
Beaked hazelnut ( <i>Corylus cornuta</i> )					91	••
Bush honeysuckle ( <i>Dienella ioniceræ</i> )					57	•••
Prairie willow ( <i>Salix humilis</i> )					57	••
Chokeberry ( <i>Prunus virginiana</i> )					48	••
Snowberry or Wolfberry ( <i>Symphoricarpos albus</i> or <i>S. occidentalis</i> )					22	••
<b>Low Shrubs</b>						
Lowbush blueberry ( <i>Vaccinium angustifolium</i> )					100	••••
Wintergreen ( <i>Gaultheria procumbens</i> )					83	•••
Pipsissewa ( <i>Chimaphila umbellata</i> )					74	••
Beerberry ( <i>Arctostaphylos uva-ursi</i> )					57	•••
Trailing arbutus ( <i>Epigaea repens</i> )					57	••
Red raspberry ( <i>Rubus idaeus</i> )					35	••
Velvet-leaved blueberry ( <i>Vaccinium myrtilloides</i> )					35	••
<b>Canopy</b>						
freq%	cover	freq%	cover	freq%	cover	
<b>Subcanopy</b>						
freq%	cover	freq%	cover	freq%	cover	
<b>Shrub Layer</b>						
freq%	cover	freq%	cover	freq%	cover	