Pinus resinosa / Vaccinium spp. Forest (Red Pine / Blueberry Dry Forest)

COMMON NAME	Red Pine / Blueberry species Forest
SYNONYM	Red Pine / Blueberry Dry Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Evergreen forest (I.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen forest (I.A.8)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.A.8.N)
FORMATION	Rounded-crowned temperate or subpolar needle-leaved evergreen forest (I.A.8.N.b)
ALLIANCE	PINUS RESINOSA FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM TERRESTRIAL

RANGE

Voyageurs National Park

This type is found througout the park on dry, rocky sites with gentle to moderate (5-20%) slopes and variable aspects.

Globally

This community is found in northern Michigan, northern Wisconsin, northern Minnesota, and northwestern Ontario.

ENVIRONMENTAL DESCRIPTION

Voyageurs National Park

Though occurring occasionally on flat terrain, the Red Pine/Blueberry Dry Forest more often occurs on gentle to moderate (5-20%) slopes with variable aspects. The substrate is typically dry to dry-mesic and very rocky. Soils are loams or sandy loams and range from 3-20 cm in depth underlain by bedrock or coarse loose rock. Typical soil development includes 1-3 cm "O" layer composed of undecomposed needle duff, 3-5 cm "A" sandy loam, 5+ cm "B" sandy loam. A low chroma "E" horizon 3-5 cm thick below the "A" horizon may or may not be present. The duff layer composed of pine needles commonly cover 60-90% of the forest floor. Smaller stands of this type typically exist on small islands within the park.

Globally

This community occurs on a variety of substrates, but typically has sandy upper horizons. Sites may be on bedrock, overlaid with shallow to medium deep (> 60 cm), coarse sand or coarse loam soils. Moisture varies from dry to dry-mesic, and stands are on mid to upper gentle slopes. The climate is highly variable, with temperature extremes between -46 C and 38 C, and anywhere from 58-91 cm of precipitation.

MOST ABUNDANT SPECIES

Voyageurs National Park

Stratum	Species
Tree canopy	*Pinus resinosa, Pinus strobus*
Tall shrub	*Abies balsamea, Corylus cornuta, Acer rubrum*
Short shrub	*Vaccinium angustifolium, Vaccinium myrtilloides, Pinus strobus, Amelanchier* spp.
Forb	*Maianthemum canadense, Aster macrophyllus*
Fern	*Pteridium aquilinum, Polypodium virginianum*
Graminoid	*Oryzopsis asperifolia*
Nonvascular	*Pleurozium schreberi, Dicranum polysetum, Dicranum scoparium, Dicranum ontariense*

Globally

Stratum	Species
Tree canopy	*Pinus resinosa*
Tall shrub	*Corylus cornuta*
Short shrub	*Vaccinium angustifolium, Vaccinium myrtilloides*
Nonvascular	*Pleurozium schreberi*

CHARACTERISTIC SPECIES
Voyageurs National Park
Pinus resinosa, Vaccinium angustifolium

Globally
Corylus cornuta, Pinus resinosa, Vaccinium angustifolium, Vaccinium myrtilloides

VEGETATION DESCRIPTION
Voyageurs National Park
Canopy coverage in the Red Pine/Blueberry Dry Forest is typically 70-90% and can consist either solely of *Pinus resinosa* or of a mixture of *Pinus resinosa* and *Pinus strobus*. *Pinus resinosa* is often the only conifer in the canopy on sites with rockier, more shallow soils. On dry-mesic sites, however, *Pinus strobus* can comprise up to 60% of the canopy. *Populus tremuloides* and *Betula papyrifera* may also exist in the canopy at <25% relative cover. Canopy height is 10-15 meters in younger stands and up to 20-35 meters in more mature stands. In stands with more complete canopy cover, understory vegetation can be sparse. A shrub layer, if present, comprises low (20%) cover and consists of *Abies balsamea, Corylus cornuta, Acer rubrum, Pinus strobus*, and *Amelanchier* spp. *Vaccinium angustifolium* and *Vaccinium myrtilloides* are common dwarf-shrubs, but rarely reach greater than 40% cover. In more open stands with exposed bedrock, *Juniperus communis* may dominate the dwarf-shrub strata with 20-30% cover. Presence of herbaceous species is highly variable ranging from virtually absent to 90% cover. Younger stands with closed canopies typically contain less herbaceous cover than more mature stands. In both cases, the herbaceous class is relatively species poor. The most abundant species are: *Maianthemum canadense, Aster macrophyllus, Pteridium aquilinum, Oryzopsis asperifolia*, and *Polypodium virginianum*. Though the cover of moss can occasionally reach 70-80%, 10-20% is more common. Important moss species include *Pleurozium schreberi, Dicranum polysetum, Dicranum scoparium,* and *Dicranum ontariense*.

Globally
This community is characterized by a pine overstory and a poorly developed understory. *Pinus resinosa* is present in the canopy at a higher cover and basal area than other conifers (typically 80% or more). *Pinus strobus* can be common in the canopy. Mesic sites tend to include *Pinus resinosa*, *Picea mariana, Picea glauca*, and *Abies balsamea* in the canopy, whereas on dry sites, *Pinus resinosa* and *Pinus banksiana* are found (MN NHP 1993). Beneath the canopy, northern hardwoods, such as *Acer rubrum* and *Betula papyrifera*, sometimes form a subcanopy. The understory ranges from moderately herb and shrub rich to extremely poor. In the tall shrub class, the important species are *Amelanchier* spp. and *Corylus cornuta*. The short shrub layer includes *Gaultheria procumbens, Linnaea borealis, Vaccinium angustifolium*, and *Vaccinium myrtilloides*, particularly where gaps in the canopy occur (Ohmann and Ream 1971). The herb layer is very poorly represented in most parts of this community's range and includes *Aralia nudicaulis, Aster macrophyllus, Cornus canadensis, Maianthemum canadense, Pteridium aquilinum*, and *Trientalis borealis*. Mosses can have very high cover, and typically include *Dicranum* spp. (e.g., *Dicranum polysetum, Dicranum scoparium*) and *Pleurozium schreberi*. The average coverage of feathermoss was greater in the northwest region of Ontario than in the northcentral region (Sims *et al.* 1989).

CONSERVATION RANK G3. There are probably over 100 occurrences of this community rangewide. Currently there are 77 occurrences documented from Michigan (where it is ranked S3), Minnesota (S3), and Wisconsin (S3); it is also reported from Manitoba (S3) and Ontario (S?). There are probably over 10,000 acres of this community rangewide. Currently 5545 acres have been documented from 45 occurrences in Michigan, Minnesota, and Wisconsin. Some sites have been degraded by logging, but there are also many mature to old-growth stands remaining.

DATABASE CODE CEGL002443

COMMENTS
Voyageurs National Park
Diagnostic features of the type include the canopy of *Pinus resinosa* with less than 40% *Pinus strobus* in the canopy. The Red Pine/Blueberry Dry Forest is very similar to the Red Pine-Aspen-Birch Forest and can be distinguished only by the differences in canopy dominants. On dry-mesic sites, the Red Pine/Blueberry Dry Forest can grade into the White Pine/Mountain Maple Mesic Forest where *Pinus strobus* in the canopy reaches > 60% cover. Where hardwoods (especially *Populus tremuloides* and *Betula papyrifera*) are also present in the canopy at > 25% cover, this type grades into the Red Pine-Aspen-Birch Forest. The Red Pine-Aspen-Birch Forest is rarely found as a distinct type; it more commonly is found as a mosiac of the Red Pine/Blueberry Dry Forest and the Aspen-Birch-Boreal Conifer Forest.

See comments on fire in Global description.

Globally
Sims *et al.* (1989) found that in the Quetico region of northwest Ontario, a rich understory of *Acer spicatum, Corylus cornuta, Alnus crispa, Diervilla lonicera,* and *Aralia nudicaulis* was established. Further north and west, however the understory was open, and dominated by low ericaceous species.

Fire is an important natural disturbance in this community. *Pinus resinosa* has adaptations that make it well suited to frequent ground fires and occasional crown fires. Reconstructions of the fire regime (Heinselman 1973, Frelich 1992) in red and white pine stands indicate that a combination of ground fires every 20 to 30 years, and severe crown fires every 100-150 years maintained presettlement *Pinus resinosa* communities. The thick, corky bark of older *Pinus resinosa* stems make them more resistant to fire than any other type of pine. These older stems are more likely to survive than those of *Pinus strobus* or *Pinus banksiana* when no crown damage results (Ahlgren 1974). In addition *Pinus resinosa* seedling establishment is favored by exposed mineral soils and high sunlight. Therefore relatively frequent fires make the continued regeneration of *Pinus resinosa* possible, as they are only moderately shade tolerant. Fire suppression over much of its range appears to be leading towards the gradual succession from *Pinus resinosa* forests to forests of mesic hardwoods or *Pinus strobus*, which under a frequent fire regime are confined to the understory (MN NHP 1993).

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Note:
This association is found in two different map classes:
1) Red Pine – Blueberry Dry Forest
2) White Pine – Red Pine – Quaking Aspen–Paper Birch Forest