

13622

Laurentian-Acadian Northern Pine(-Oak) Forest - Pine Dominated

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Forest and Woodland

Map Zones

41, 50

Model Splits or Lumps

This type is mesic to dry-mesic end of soil drainage continuum. Splits from 13621 which is more mesic. Fire Regime Group III (13621 is Fire Regime Group I).

Geographic Range

The red pine (*Pinus resinosa*), white pine (*Pinus strobus*) cover type is found throughout the Great Lakes region, including northern Minnesota, Wisconsin, and Michigan. This red-white pine community described here is for map zone (MZ) 41 and historically occurred mainly in subsection 212La but also in 212Lb, c, d, and e. For MZ50, 212xb, also smaller patches across northern Wisconsin.

Biophysical Site Description

The area is on part of the Laurentian Peneplain and is geologically complex. It is underlain with Precambrian rock mainly granite, greenstones, and slates. Soils where the type occurs are composed of sandy to sandy gravelly loams and till (Heinselman 1996; Ohmann and Ream 1971). Frequently occurs on end moraines.

Vegetation Description

Red pine often shares dominance with white pine in the overstory, red pine being more dominant on the drier sites. Balsam fir, white and black spruce, and white cedar may also be present. The tall shrub layer is not normally abundant with beaked hazel, green alder, and junberry being the most common. The ground vegetation is often sparse, dominated by blueberry, sweet fern (*Comptonia peregrina*), large-leafed aster, and wild sarsaparilla (*Aralia nudicaulis*). Less abundant are bearberry (*Arctostaphylos uva-ursi*), wintergreen, and pipsissewa.

Stands are multi-aged, with at least two cohorts. Historically, there was often a super-canopy pine cohort followed by a younger, more abundant pine cohort. Due to variation in fire severity, there are small- to medium-scale inclusions of different cohorts within large stands (Heinselman 1996; Van Wagner 1971).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PIRE	<i>Pinus resinosa</i>	Red pine
PIST	<i>Pinus strobus</i>	Eastern white pine
BEPA	<i>Betula papyrifera</i>	Paper birch
POTR5	<i>Populus grandidentata</i>	Bigtooth aspen
ABBA	<i>Abies balsamea</i>	Balsam fir
VAAN	<i>Vaccinium angustifolium</i>	Lowbush blueberry

Species names are from the NRCS PLANTS database. Check species codes at <http://plants.usda.gov>.

Disturbance Description

The fire regime is characterized by semi-frequent surface fires and infrequent crown fires with red pine stands burning more frequently than white pine. The average frequency for red pine is in the range of 10-40yrs (Heinselman 1973; Frissell 1973). The lower bound frequency for white pine is slightly longer with a range of 20-40yrs. These periodic surface fires can perpetuate the stand indefinitely, barring other disturbances such as logging or windthrow. Stand-replacement fires occur every 150-200yrs and 200-250yrs for red and white pine, respectively.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	228	15		
Moderate (Mixed)				
Low (Surface)	40	85		
All Fires	34	100		

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Landscape must be adequate in size to contain natural variation in vegetation and disturbance regime. Though the virgin stands of red and white pine are greatly reduced from pre-settlement conditions, scattered stands and ecosystems still exist to represent this type. The Boundary Waters Canoe Area Wilderness (BWCAW) is an example, along with the national forests in Minnesota (Chippewa, Superior), Michigan (Ottawa, Hiawatha), and Wisconsin (Chequamegon-Nicolet) and Menominee Reservation in Wisconsin.

Adjacency or Identification Concerns

Due to the complexity of the landform, adjacent types can include any type common to the region. However, most common adjacent types include jack pine, aspen, birch, and fir (mixedwood).

As seen today, the shrub/hardwood understory of this type is much denser than was common historically due to fire suppression.

Some sites were converted to aspen birch after logging. This occurred on the more mesic sites where the initial condition had a high component of aspen and birch.

Much of this type was heavily altered during landscape-scale historical harvesting in the late 1800s and early 1900s (Mladenoff and Pastor 1993).

Issues or Problems

The VDDT model was modified to increase the probability of wind storm events. Frelich has documented wind disturbance of catastrophic proportions as occurring on a 1,000-2,000yr interval. Granted that this may possibly be the landscape-level mean, wind events are far more prevalent and occur randomly and with widespread regularity throughout the range of the red and white pine cover type.

Native Uncharacteristic Conditions

Comments

Prior to LANDFIRE Remap this BpS was named Laurentian-Acadian Northern Pine Forest.

Succession Classes

Mapping Rules

Upper Layer Lifeform	Height (m)	Canopy Cover (%)									
		0-10	11-20	21-30	31-40	41 - 50	51-60	61-70	71-80	81-90	91-100
Herb	0-0.5	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Herb	0.5-1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Herb	>1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0-0.5	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	>3.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	0-5	A	A	A	A	A	A	A	A	A	A
Tree	5-10	A	A	A	A	A	A	A	A	A	A
Tree	10-25	UN	UN	UN	UN	B	B	B	D	E	E
Tree	25-50	UN	UN	UN	UN	C	C	C	D	E	E
Tree	>50	UN	UN	UN	UN	C	C	C	D	E	E

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

Description

Class A	18	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIRE	<i>Pinus resinosa</i>	Red pine	Upper
PIST	<i>Pinus strobus</i>	Eastern white pine	Upper
PIBA2	<i>Pinus banksiana</i>	Jack pine	Upper
BEPA	<i>Betula papyrifera</i>	Paper birch	Upper

Description

This class is a regeneration phase following a stand-replacing fire or wind disturbance. A nearby seed source is assumed, which regenerates the site to red/white pine. It consists mainly of red pine, white pine, jack pine, paper birch, aspen, and red maple. It is typically dominated by red and white pine with lesser amounts of other species.

Maximum Tree Size Class

Class B	18	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIRE	Pinus resinosa	Red pine	Upper
PIST	Pinus strobus	Eastern white pine	Upper
BEPA	Betula papyrifera	Paper birch	Mid-Upper
ABBA	Abies balsamea	Balsam fir	Low-Mid

Description

This stage also includes scattered paper birch, jack pine, balsam fir, red maple, and occasionally oak. In this stage, red and white pine dominate and overtop the hardwoods and fir. Black and white spruce become more common.

Maximum Tree Size Class

Pole 5-9" DBH

Class C	15	Mid Development 2 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIRE	Pinus resinosa	Red pine	Upper
PIST	Pinus strobus	Eastern white pine	Upper
ABBA	Abies balsamea	Balsam fir	Mid-Upper

Description

Without fire, balsam fir increases in density, as do birch and maple, and form a sporadic midstory. What aspen was present initially begins to drop out due to windthrow. Red and white pine continue to dominate the upper canopy.

Maximum Tree Size Class

Medium 9-21" DBH

Class D	18	Late Development 1 - Closed
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Indicator Species

Replacement Fire	Mid1:CLS	Early1:ALL	0.007	143	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.03	33	No	0
Wind or Weather or Stress	Mid2:CLS	Early1:ALL	0.001	1000	Yes	0
Replacement Fire	Mid2:CLS	Early1:ALL	0.007	143	Yes	0
Surface Fire	Mid2:CLS	Mid2:CLS	0.03	33	No	0
Wind or Weather or Stress	Late1:CLS	Mid1:CLS	0.001	1000	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.004	250	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.03	33	No	0
Wind or Weather or Stress	Late2:CLS	Mid1:CLS	0.001	1000	Yes	0
Wind or Weather or Stress	Late2:CLS	Early1:ALL	0.001	1000	Yes	0
Replacement Fire	Late2:CLS	Early1:ALL	0.004	250	Yes	0
Surface Fire	Late2:CLS	Late2:CLS	0.03	33	No	0

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