

Red Pine

Covertype Fact Sheet

This document is adapted from the Minnesota DNR, Division of Forestry's Cover Type Guidelines and the USDA Forest Service and University of Minnesota's North Central Region Red Pine Management Guide.

This fact sheet provides a brief overview of silvicultural considerations for red pine in Minnesota.

About red pine communities

Red pine (*Pinus resinosa*) communities typically exist on moderately well to well drained sand, loamy sand, and sandy loam soils. This species requires a minimum 30" rooting zone free of root restricting barriers such as saturated soils, bedrock, or very dense soil horizons.

Even though red pine is a low moisture and nutrient demanding species, it can grow very well on rich, fine textured soils if these soils have at least 30" of well aerated rooting zone. Red pine does not compete well with the denser vegetation on these richer sites and does not tend to utilize richer sites as effectively as other species.

Major tree species

In the northern Lake States red pine tends to exist in pure or almost pure stands. Associated tree species include white pine (*Pinus strobus*), jack pine (*Pinus banksiana*), and paper birch (*Betula papyrifera*).



Laurentian Mixed Forest province (left) and Eastern Broadleaf Forest. MNDNR images.

Range in Minnesota

Red pine grows well throughout the Laurentian Mixed Forest province (northeastern Minnesota). On the right sites, it also grows well in the Eastern Broadleaf province (central Minnesota).

Silviculture

Because of red pine's extreme shade intolerance, clearcutting is the most common harvest system for red pine in Minnesota. On quality sites in Minnesota, red pine can be thinned commercially at between 30 and 40 years after stand initiation. Stands can be thinned every 10-15 years thereafter.

Rotation ages

Red pine can live for up to 250 years. In Minnesota, red pine is typically grown on an 80 to 100 year rotation. Longer rotations optimize growth on less productive sites.

Regeneration considerations

Intolerance of shade and potentially serious disease threats make natural regeneration of red pine problematic in most cases. In Minnesota red pine is typically regenerated through planting of bare root or containerized seedlings. Control of competing vegetation is often required for the first several years after planting.

Disease and pest considerations

Red pine is fairly resistant to insect and disease problems, but not entirely free from them. The major diseases of red pine include *Armillaria* root rot (*Armillaria* spp), *Diplodia* tip blight (*Sphaeropsis ellisi*), and *Sirococcus* shoot blight (*Sirococcus strobilinus*).

Armillaria root rot can be an important mortality factor in young stands on former hardwood sites. Both *Diplodia* and *Sirococcus* can cause shoot dieback and can lead to tree mortality through repeated infections. *Diplodia* can form main stem cankers and cause rapid tree death when trees are under stress from drought and hail injury.

Management recommendations to reduce losses: Avoid new red pine plantings adjacent to older red pine plantations with insect and disease outbreaks. Mature red pine trees are potential carriers of *Diplodia* and *Sirococcus*.

Do not plant red pine in low areas (frost pockets) or within one half mile of an existing *Sclerotellus* infection. Do not replant old infection sites to red pine.

To reduce bark beetle and wood borer damage, remove all slash material larger than two inches in diameter within three weeks after any harvest between March 1 and September 1. For slash left on site, leave branches with the green needles on and expose the slash to full sunlight to aid in rapid drying of residual material.

Wildlife considerations

Red pine plantations generally provide limited food and cover for game birds and animals but large trees may be used by birds of prey. Landings can serve as wildlife openings and provide needed food plants. Red pine plantations can be planned to provide better habitat values by including openings and structural diversity. Natural stands are fair habitat because of species mix and irregular spacing. Wildlife habitat can be improved by breaking up large uniform stands create patches of trees with

Special silvicultural considerations

1. Diversify stand structure. Red pine is a very common plantation species. Introducing structural diversity by creating wildlife openings and creating patches of different ages can make red pine plantations more beneficial for wildlife.

2. Maximize growth rate and merchantable volume by thinning. Total stand yield may or may not be higher than the total volume of an unthinned stand. Thinning, however, captures volume otherwise lost to mortality. Thus, total merchantable volume removed over the life of a stand is generally greater with regular thinning.

References for more detail

Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province. 2003. MNDNR, St. Paul, MN.

Field Guide to the Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province. 2005. MNDNR, St. Paul, MN.

North Central Region Red Pine Management Guide. Available at <http://ncrs.fs.fed.us/fmg/nfmg/rp/>. 2006. USDA Forest Service and University of Minnesota Department of Forest Resources.

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Silvics of North America. Agriculture Handbook 654. Online at http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm. 1990. USDA, Washington, DC.