

# White Pine

## Minnesota Silvicultural Guidelines

This document is adapted from the Minnesota DNR, Division of Forestry's Cover Type Guidelines. This fact sheet provides a brief overview of silvicultural considerations for white pine in Minnesota.

### About white pine communities

Management of white pine should be aimed at maintaining the current white pine cover type as well as increasing its presence on appropriate sites within its range. Several factors should be considered when managing white pine stands and white pine as a component of other types. These include: A) consideration of a stand for its visual value or old forest status; B) retaining large individual trees for their visual value; C) the use of harvesting systems that favor natural regeneration; D) the planting of white pine in other types to reestablish the species as a component in other forest cover types. For all management objectives, a commitment must be made to manage white pine pest problems.

White pine occurs on a very wide range of site conditions. Good growth occurs on most texture and drainage classes. It is more tolerant of wet conditions than red pine or jack pine but is less tolerant of drought conditions. It has the highest overall nutrient demand of all conifers. Best growth will occur on sites with medium to fine soil texture, medium to high fertility, somewhat poorly drained to well-drained soil, constant moisture supply, and a rooting zone greater than 18 inches deep.

### Major tree species

White pine (*Pinus strobus*) generally grows in mixed stands. Common associated species include red pine (*Pinus resinosa*), paper birch (*Betula papyrifera*), red oak (*Quercus rubra*), red maple (*Acer rubrum*), and white spruce (*Picea glauca*).

### Range in Minnesota

White pine grows well throughout the Laurentian Mixed Forest province (northeastern Minnesota) and the Eastern Broadleaf province (central Minnesota).

### Silviculture

Periodic selection harvests are recommended to develop larger sawlog trees while salvaging pest damaged trees. Thinning from below may be done at 10 year thinning intervals.

In high and medium blister rust risk zones (approximately north of Mille Lacs Lake), a two-cut shelterwood method is the best way to allow a mixed hardwood-pine stand to regenerate. The first cut should remove 40% to 60% of the canopy.

In lower blister rust risk areas (approximately south of Mille Lacs Lake), white pine can be managed on the clearcutting system.



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

## Recommended rotation ages

Estimated rotation ages are 80 years on less productive sites and 100 years on more productive sites.

## Regeneration considerations

The opportunity to establish white pine as an understory component of other types should be emphasized. White pine is of intermediate shade tolerance and can become established under the lighter canopies of birch and pines. White pine is generally unable to gain a canopy position in better aspen, oak, or maple stands. Understory planting on appropriate sites can be used to introduce a white pine component into other cover types.

## Disease and pest considerations

White pine blister rust (*Cronartium ribicola*), and white pine weevil (*Pissodes strobi*), are the major insect and disease problems of white pine. These problems have restricted new plantings and greatly reduced the existing commercial range of the species. Introduced pine sawfly (*Diprion similis*), may at times be responsible for local severe defoliation and some top kill.

### Management recommendations to reduce losses:

**In high and medium blister rust hazard zones**, only establish white pine if the existing canopy can be removed gradually. Maintaining a partial canopy will reduce blister rust spore infections by reducing understory humidity and temperature. A partial canopy will also reduce weevil attacks.

In openings, spacing between crowns should not exceed one-fourth the height of the surrounding trees. Once a stand is established, thinning must be carried out to maintain maximum height growth.

Plan to prune lower branches to 50% of live crown at age 5-7 and every two years thereafter until there are no branches within 9 feet of ground level.

**In lower blister rust risk zones**, thinning and pruning should be carried out as above. Avoid areas where cold air collects at night or on the edges of forest openings.

## Wildlife considerations

White pine has a fair to good overall rating for wildlife. Both birds and mammals use this species as escape cover and severe weather cover particularly when the trees are young. As white pine ages, its cover value lessens. Seed and browse value is fair. White pine is good for cavity nesters. Mature trees within a quarter mile of water are the most frequently used eagle and osprey nest sites.

## References for more detail

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

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

*Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines for Landowners, Loggers, and Resource Managers.* Minnesota Forest Resources Council, St. Paul, MN.

*Silvics of North America.* Agriculture Handbook 654. Online at [http://www.na.fs.fed.us/spfo/pubs/silvics\\_manual/table\\_of\\_contents.htm](http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm). USDA, Washington, DC.