

WHITE PINE

Cover Type Guidelines

HARVEST SYSTEMS

1. In all blister rust hazard zones, periodic selective harvests are recommended to develop larger sawlog trees while salvaging pest damaged trees. Thinning from below may be done at 10-year thinning intervals. Refer to stocking chart for white pine.
2. In blister rust hazard zones 1 and 2, clearcuts are feasible at the following rotation ages:

<u>Site Index</u>	<u>Commercial Rotation Age</u>
under 55	80 years
55 and over	100 years

3. In blister rust hazard zones 3 and 4, a two-cut shelterwood method is preferred to allow a mixed hardwood-pine stand to regenerate. The first cut should remove 40% to 60% of the overstory.
4. Scattered large white pine trees (uneconomical harvest volumes) in timber sales of other species may be left for visual and wildlife value and as a seed source for additional natural white pine regeneration.

PREFERRED SITE CONDITIONS

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 with the following site characteristics:

- medium to fine soil texture
- medium to high fertility
- somewhat poor to well-drained soil
- constant moisture supply
- rooting zone greater than 18 inches deep.

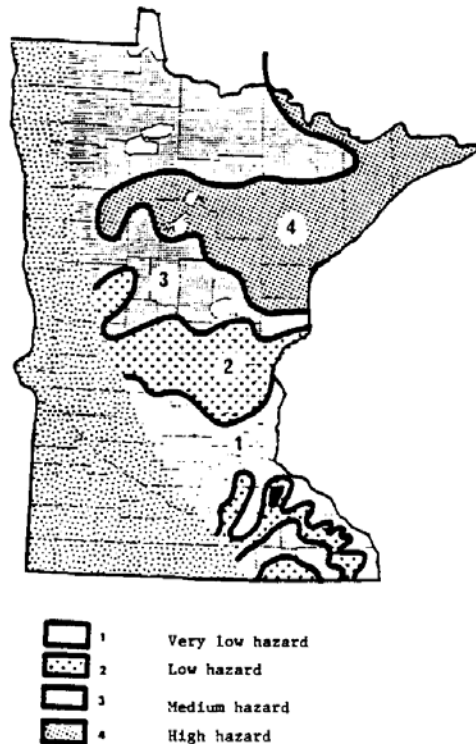
REGENERATION SYSTEM

1. Natural Seeding from Shelterwood Cutting:
 - Mineral soil must be exposed and the first cut should be timed to correspond to a heavy seed crop.

2. Planting:

- Hazard zone 1: No restrictions.
- Hazard zone 2: Avoid microclimatic factors favoring disease development; a light overstory and gradual basal pruning are recommended.
- Hazard zone 3: Avoid microclimatic factors favoring disease development; understory planting and basal pruning are mandatory.
- Hazard zone 4: Avoid microclimatic factors favoring disease development; understory planting and basal pruning are mandatory; expect up to 25% loss due to blister rust even when following all prescribed management practices.

White Pine Hazard Zones



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.

CULTURAL PRACTICES

Basal Pruning In hazard zones 2, 3, and 4 start pruning at ages 5-7, and continue pruning until bottom live branches are at least 9 feet above the ground.

Canker Pruning Prune branches with active cankers if inner canker margins are 3 to 18 inches from the bole. Branches with cankers beyond 18 inches can be left on the trees or pruned during the normal basal pruning cycle.

Release Maintain the hardwood overstory, particularly in zones 3 and 4, so the pines grow at least 2 feet per year after the trees are 3 feet tall. Final release can be done when the pine reach at least 35 feet in height.

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 with some top kill occurring. Management guidelines are as follows:

A. Recommendations for establishment of white pine in the high and medium blister rust hazard zones (zones 3 and 4) of northern Minnesota are as follows:

1. Establishment must be attempted only in understory situations where it is possible to control the overstory through gradual removals. This will change understory humidity and temperature conditions so that blister rust spore infections will be reduced. It will also make weevil attacks less likely or severe. Spacing in openings (space between crowns) should not exceed one-fourth the height of the surrounding trees. Once a stand is established, thinning must be carried out in a manner which allows maximum height growth to be maintained.
2. Plan to prune lower branches to 50% of live crown at age 5-7 and continuing every two years until there are no branches within 9 feet of ground level.
3. Manage for White Pine only in medium and high site index areas: site index 60 to 80.
4. Final release should be carried out when trees reach 35 feet.
5. Consider use of resistant stock when it becomes available.
6. For further recommendations, contact the Regional Forest Insect and Disease Specialists.

B. In central and southern Minnesota (hazard zones 1 and 2), neither the blister rust or the white pine weevil are as severe a problem as in the north.

1. Only high and medium white pine sites (S.I. 60-80) should be considered for thinning, pruning, or release work.
2. Thinning and pruning should be carried out as above.
3. Managed areas should not be located in areas where cold air collects at night or on the edges of forest openings.

In all cases, future plans for tending an intensively managed stand should be laid out prior to initiation of management and clearly adhered to.

The second generation of the Introduced Pine Sawfly can usually be controlled by the application of insecticide should it become a problem. In this case, contact the Regional Forest Insect and Disease Specialist.

White pine is intolerant to drought, salt spray, and ozone.

Deer and hare browsing can be a major obstacle to plantation establishment.

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.