

## **Balsam fir and white spruce**

The threats to the balsam fir and spruce on your woodland include spruce budworm, heart rot and root rot, and wind damage.

Dense areas or stands of balsam fir are subject to decline and death from spruce budworm. The dying and dead trees increase fire risk. Removal of all balsam fir will reduce fire risk and create openings for the future forest. Thinning can be an alternative option but may not provide the reduction in fire risk desired and even selecting the healthiest balsam to remain may not prevent the death of these trees.

See the Minnesota Department of Natural Resources fact sheet on [Eastern Spruce budworm management](#).

## **Thinning**

While removal of all balsam fir is the preferred option, thinning will open space for new trees, and may reduce the impact of spruce budworm. If reduction in fire risk is desired removal of all balsam is the best approach.

### ***How much to thin, using basal area or spacing between trees***

How many trees should be removed? Basal area or spacing between trees may be used to determine how many trees to remove. Plan to thin balsam to a basal area of ninety square feet per acre.<sup>1</sup> Another measure of how much to thin is to seek an average spacing of 20 to 25 feet between the large (greater than 8 inches in diameter) healthy balsam fir and spruce trees.

Trees that are healthy may or may not survive after a spruce budworm outbreak. Healthy trees typically have more than 50% live crowns. When deciding which trees to cut, leave trees with more than 50% live crown and leave all healthy spruce except in areas where the spruce is closer than 6 feet apart. In these areas, thin the spruce to a 12 to 15 foot spacing with clusters of trees that are closer together. When deciding between a balsam and a hardwood tree, leave all hardwoods.

### ***Examples of thinning and balsam removal***

- Camp Voyageur story - [Why we cut down the Balsams](#)
- USDA NRCS – [Two Harbors Spruce Budworm Forestry Project](#)
- Jim Widen, landowner Lake County and the NRCS video, [Forest Management of Private Land in NE Minnesota](#)

## **How to Get the Thinning Done**

Doing this work yourself is possible but is physically challenging and time consuming. It may take years to accomplish when working on your own. An alternative is to focus on conducting as much balsam fir treatment (removal) as financially possible through contractors.

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<sup>1</sup> Basal area is a measure of tree density equal to the sum of the cross-sectional area of all the trees on one acre of land. See [Making and Using Measurement Tools -Basal Area](#)

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