



# Ice Storm 1998

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USDA Forest Service, Durham, NH



## Silvicultural Approaches For Managing Ice-Damaged Stands

The severe ice storm of January 1998 caused damage on an estimated 17 million acres of forestland across Maine, New Hampshire, Vermont, and New York. Damage was highly variable within stands. Some trees suffered broken branches and tops, others were bent over, and in some cases trees were uprooted.

**Evaluate the damage.** It is important that forest landowners get an accurate estimate of the damage to their stands. This can best be done by a professional forester. It is usually necessary to take some sort of inventory plots to estimate the severity of damage. Generally, three classes of ice damage are recognized for standing trees: less than 50% crown loss, 50-75% crown loss and over 75% crown loss. Trees with less than 50% crown loss have a good chance of fully recovering. Trees with 50-75% crown loss can be retained, but may develop stain and decay, and as such should be reevaluated in 3 to 5 years. Trees with over 75% crown loss are at risk of dying or heavy infestation of insects and diseases and should be considered for harvest within the next year.

Conifers, if stressed enough by crown loss, will be susceptible to attack by bark beetles and wood borers this summer, especially if they were not vigorous when winter arrived. Along with these insects will come blue stain, which may degrade the value of lumber sawed from infested trees. Severely damaged, low vigor conifers and downed conifers should be harvested this summer. There is no immediate need to harvest standing hardwoods. The spread of discoloration and decay in hardwoods is much slower than it is in conifers. Downed hardwoods will be degraded within one or two growing seasons.

### Silvicultural Considerations

Several silvicultural considerations need to be addressed when managing stands that have a significant amount of ice damage.

- 1. Stocking.** To minimize development and persistence of epicormic branches on hardwoods, and to maintain optimum volume growth per acre, stocking should remain at or slightly above the B-line (optimal stocking -- about 65 sq. ft./ac. for hardwoods and 100 sq. ft./ac. for conifers). B-level stocking can be visualized as removing about every third tree from a fully stocked stand. If removing all the ice-damaged trees would reduce the stocking below the B-line, then it might be appropriate to leave some of the less severely damaged trees.
- 2. Epicormic branches.** Exposure to light can lead to epicormic branching on hardwood species. If the stocking is below 80 square feet per acre in northern hardwood stands, these newly formed epicormic branches may persist and lead toward lower timber quality. Epicormic sprouting is of less concern i.e., less sprouting and higher on the bole, in dominant trees with full crowns, in sawtimber-sized trees as compared to pole-sized trees, and in trees with lower levels of damage. It may be advisable to retain some damaged trees to reduce the epicormic sprouting on the highest value trees.

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3. **Consider group selection.** The ice damage seemed to be very patchy. Individual 1/4 acres may be heavily damaged adjacent to lightly damaged areas. Patches of heavily damaged trees are logical places for groups. Groups less than 1/4 acre in size will have a high proportion of shade tolerant species, like beech and sugar maple. Groups over 2/3 acre in size will have a higher amount of shade intolerant regeneration like fire cherry, aspen, and paper birch. Groups between 1/4 and 2/3 acre in size will have a mixture of tolerant and intolerant species as well as some intermediately tolerant like white ash, yellow birch, and red oak. Generally, group selection harvesting guidelines call for putting 10-15% of the stand area into groups at each stand entry. The entire stand would be cut over to 7 to 10 entries, which would be up to 150 years if a 15-year entry cycle were used. Improvement cutting is applied between the groups to reduce the basal area to about 70 square feet per acre. Marking guidelines harvest trees that would significantly decrease in value and would release residual crop trees. It may be advisable to leave some dominant, fully- crowned trees with little damage or defect within some groups.
4. **Concentrate on sawtimber/large poletimber stands.** Although sapling and regeneration stands may have a lot of bent over trees, most of these stems will recover from ice damage. It would be advisable to reevaluate damaged sapling stands in 3 to 5 years. If patches of the stands have not fully recovered then perhaps consider group selection. For sawtimber and poletimber stands, usually 5-7 cords per acre or 2,000 board feet per acre are needed for a commercial harvest.
5. **Wildlife trees.** Not all damaged trees need to be removed. In particular, trees over 18 inches dbh with broken tops or large broken limbs have a good chance of developing into valuable wildlife cavity trees. This is true for both hardwoods and softwoods. It is a good idea to retain some of these damaged trees.
6. **Residual stand damage.** Damage to residual trees during ice damage harvest operations should be avoided. A wound on the butt log is far more serious in terms of economic value loss than a wound from a broken limb in the crown. It makes little sense to harvest storm damaged trees if the residual trees are damaged in the process. Some things to consider are:

Consider marking the trees to be removed on both sides of the stem and near groundline. This allows the harvester to see the cut and residual trees from all angles, which helps to reduce residual stand damage.

Don't harvest during the spring when soft ground will cause excessive root injury. If possible, don't harvest during the growing season (May-July) when the "bark is slipping." Residual trees are much more susceptible to wounds caused by felling and skidding during the growing season.

Every stand is different and each landowner has unique goals for her or his property. These general guidelines can help landowners and professional natural resource managers make decisions about managing ice-damaged stands, but they must be tempered with knowledge of local ecology and economic conditions.



*Don't Panic! Stop, Think and Be Patient.*

*Safety First and Foremost.*

*Get Professional Advice.*



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