

THE NORTHEASTERN ICE STORM 1998

Highlights of a Forest Damage Assessment for New York, Vermont, New Hampshire, and Maine

■ **The ice storm of January 1998** affected 17 million acres of forestland in northern New York, Vermont, New Hampshire, and Maine, including parts of the Green Mountain National Forest and the White Mountain National Forest. Portions of eastern Canada were also impacted. The weight of accumulated ice caused trees to snap off or bend over to the ground. Large branches broke within crowns and debris littered the landscape.

NEW YORK	4.6 MILLION ACRES
VERMONT	951,000 ACRES
NEW HAMPSHIRE	1,055,000 ACRES
MAINE	11 MILLION ACRES

■ **Aerial surveys** conducted following the ice storm provided information on the location, pattern, and level of the damage, which was used to create state and regional maps. The maps helped in planning ground surveys to assess the severity of the damage and to characterize the type of damage to rural forests. The damage assessment was conducted by state and Federal forestry agencies during the spring and summer of 1998. Regional survey temporary

plots, along with Forest Inventory and Analysis, Forest Health Monitoring, North American Maple Project, and Vermont Hardwood Health Survey permanent plots, were included in the assessment. All plots were located within the “footprint” of the storm, as defined by the aerial surveys.

■ **The impact to forests** varied greatly, both within forest stands and throughout the four-state affected area. Topography, forest composition, and meteorological conditions influenced the amount of damage. Locally, different degrees of damage occurred in a mosaic pattern, with patches of intense damage imbedded within larger less damaged areas. Individual landowners with a high-quality timber stand or high-yielding sugarbush that suffered an average crown loss of 50 percent or more incurred significant losses.

■ **Damaged beech, maple, and birch**, which are major components of northern hardwood stands, were frequently encountered within the ice storm impacted areas. American beech was the most uniformly impacted tree, most likely due to the incidence of beech bark disease, which weakens the wood structure. Hardwoods with fairly soft, brittle wood, including aspen, ash, basswood, and black cherry, also received higher than average damage. Softwoods had considerably less damage than hardwoods.

■ **The influence of ice damage** on mortality and growth may be important. Between one-fifth and one-fourth of the over 22,000 trees sampled have



Percent of trees sampled with diameter ≥ 5 " in each crown loss category

Crown loss	New York	Vermont	New Hampshire	Maine	Region
No damage (0%)	44.7	59.5	49.5	54.2	51.0
Light/moderate (1-49%)	28.4	24.5	27.2	28.8	27.7
Heavy (50-79%)	11.4	7.6	9.3	8.4	9.5
Severe (80-100%)	15.5	8.4	13.5	8.6	11.8

been seriously damaged or killed. Another one-third received light/moderate damage. The average crown loss due to branch breakage was 22 percent across the four-state affected area, ranging from no damage to 100 percent crown loss.

■ **Larger trees** were more likely to incur some ice storm damage. About 60 percent of the trees with a diameter greater than 10 inches were damaged by the ice storm. Understory saplings received considerably less damage than overstory trees.

■ **About 30 percent** of surveyed plots were in the high or moderate fire hazard categories. Fire hazard increased with amount of crown damage. Impacts from debris on forest access continue to be a concern.

■ **Data taken in plots** maintained by the North American Maple Project indicate that damage was more severe in nonsugarbush sugar maple stands than sugarbushes. Lower elevation sugarbushes with larger but fewer sugar maple stems were more resistant to the storm.

■ **Damage to sugarbushes** was especially severe in northern New York. On average, about 26 percent of sugar maple within the damaged sugarbushes that were sampled in the state were severely damaged and most likely will not survive.

■ **Aerial photography and satellite imagery** provided images of the storm that are now available for use. Images from color infrared digital cameras are being evaluated for detection and mapping of ice storms and other natural disasters.

■ **The 1998 field assessment** was not designed to determine the loss of timber volume or impacts on wood quality. Ongoing Forest Inventory and Analysis and Forest Health Monitoring surveys can provide information on the future status and condition of forest resources within the ice storm affected area.

■ **Monitoring projects** are underway to determine effects of damage on wood quality, wildlife habitats, plant communities, forest insects, aquatic habitats, sugarbushes, urban trees, and more.

Prepared by the USDA Forest Service in cooperation the North East State Foresters Association (NEFA) and the state forestry agencies in New York, Vermont, New Hampshire, and Maine, December 1999. Copies of the full report are available through:



NEFA
 PO Box 2911
 Concord, NH 03302-2911
 Phone: 603-229-4945
 E-mail: inrscal@aol.com
 Website: <http://nefa.conknet.com>



USDA Forest Service
 PO Box 640
 Durham, NH 03824
 Phone: 603-868-7712
 E-mail: mweeks/na_du@fs.fed.us
 Website: www.fs.fed.us/na/durham/ice/index.htm