



THE NORTHEASTERN

# ICE STORM

1998. Effects

on the Forests

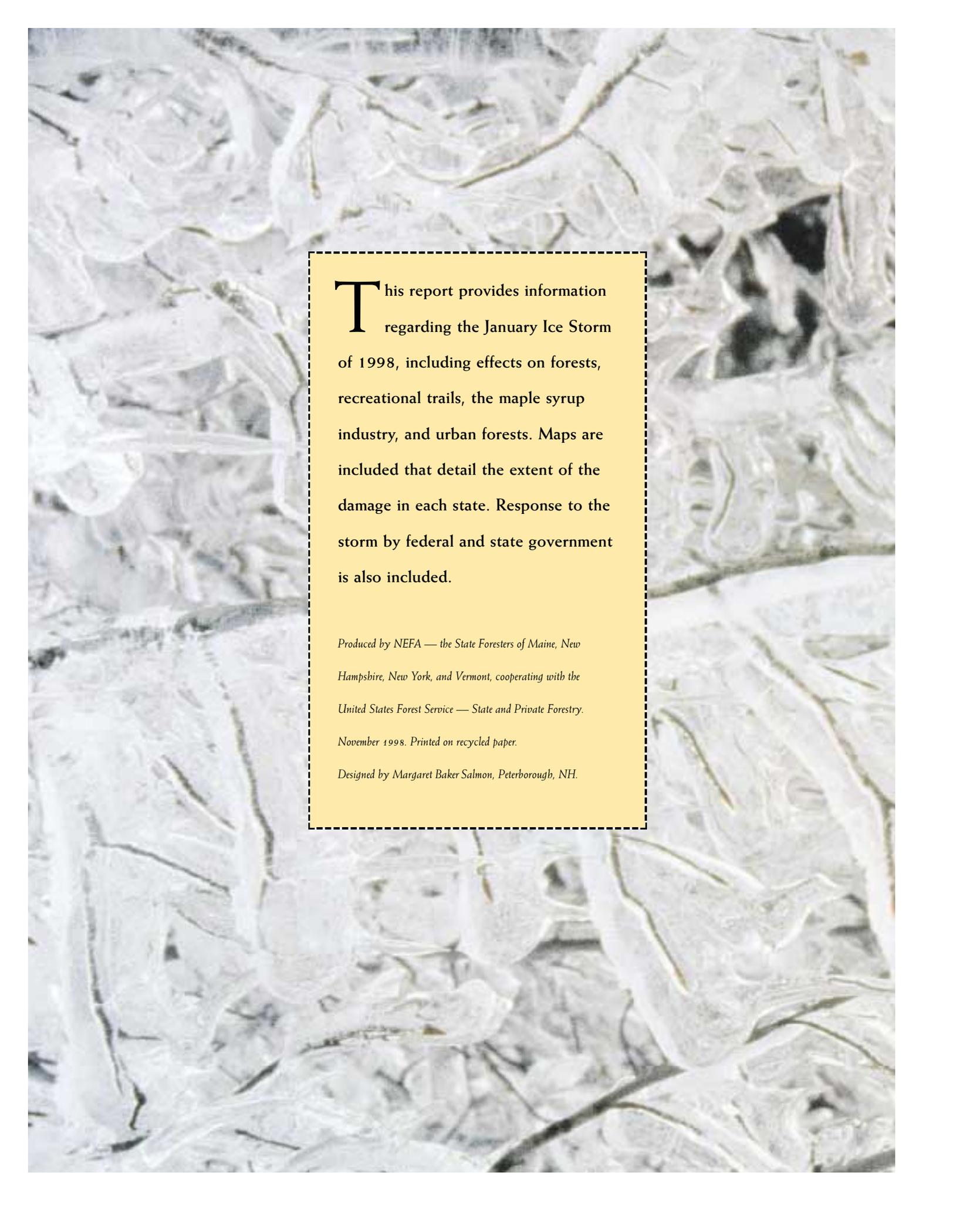
and People

of Maine,

New Hampshire,

New York,

and Vermont



**T**his report provides information regarding the January Ice Storm of 1998, including effects on forests, recreational trails, the maple syrup industry, and urban forests. Maps are included that detail the extent of the damage in each state. Response to the storm by federal and state government is also included.

*Produced by NEFA — the State Foresters of Maine, New Hampshire, New York, and Vermont, cooperating with the United States Forest Service — State and Private Forestry.*

*November 1998. Printed on recycled paper.*

*Designed by Margaret Baker Salmon, Peterborough, NH.*



## *The* **ICE STORM** *of January 1998*

**I**N JANUARY OF 1998, a series of ice storms blanketed northern New England and New York with up to three inches of ice. Forestland covers 40 million acres of this region, and 17 million acres of those forests were damaged by the storm. Five million acres were severely damaged. Thousands of urban trees were also affected, with snapped limbs toppling power lines across the region. Some people were without power for two weeks and a total of 37 counties were declared federal disaster areas. Meteorologists have called the storm a “100-year event,” and many compare it to the great hurricane of 1938. Estimates for natural resource losses exceed \$1 billion.

# In the Forest

**B**IOLOGICAL IMPACTS to the forests of northern New England and New York are both obvious and hidden. Damage to trees was highly variable within forest stands. Some trees suffered broken branches and tops, others were bent over, and in some cases trees were uprooted. The extent, frequency, and severity of damage is currently being assessed on both a forest stand and an individual tree basis. Landowners have been advised to harvest trees that have sustained loss of more than 75% of the crown and to observe the rest over the next several years. If forests are subjected to other environmental stresses, such as drought, trees that survived the ice damage could be more prone to insect and disease problems and might die. Loss of shade near streams could warm the water and affect cold water fishes like trout.

Because the storm was short in duration and most of the ice melted soon after the event, there have been some benefits to wildlife. Fallen and broken branches full of buds and twigs are now within reach for food, and will also provide cover. Areas exposed to more sunlight in the forest will allow sprouting of herbs and shrubs, creating another food source. Breakage on trees



Chris Costello

provides entry for decay and will later become a cavity, creating homes for many birds and small mammals.

There are no clear estimates of economic impacts from the loss of timber caused by this storm. For the people who use the forests and depend on them for their livelihood, the impact is dramatic. Initial estimates indicate about \$650 million in losses. Many rural landowners will lose forest income and access to their woods. Management plans for those forests may now be obsolete. Loggers, already in a risky profession, face working in woodlots with broken limbs overhead and debris underfoot. Debris increases the risk of fire and impedes access to any blazes that may occur.

## John Gibbs, Beaver & Bedrock Tree Farm, DeKalb, New York

**John Gibbs** has worked as a forester for the New York Department of Environmental Conservation for over ten years, and he knows the forests of St. Lawrence County pretty well. But the ice storm of January 1998 hit that region of New York particularly hard and many of those forests have now become unfamiliar and inaccessible. John Gibbs recalls being at home during the storm and "sitting at my dining room table, with a sick stomach, watching my trees fall apart."

The Beaver and Bedrock Tree Farm consists of 260 acres of forests, wetlands, and pasture. Mr. Gibbs has been actively managing 160 acres of young sugar maple, planning a harvest that would supplement his retirement fund. Those trees are now completely destroyed — snapped, bent over, and uprooted. To make matters worse, much of the damage is located in inaccessible areas of the woodlot. Mr. Gibbs has marked the timber that can be harvested, updated his Stewardship Plan, and designed a one-mile road to access the downed wood. He will get assistance for all these practices from the emergency appropriation money provided by Congress.

"For me," says Mr. Gibbs, "the loss is more economic than ecological. There is good reproduction in the stands that were heavily damaged, so I know the forests will recover, but my investment will not. However, I take my role as steward very seriously and I will make sure that the forest I pass on will be in good shape."



John Gibbs

Pat Whalen

**Tom Thomson, Thomson's Family Tree Farm, Orford, New Hampshire**

**"If we grew** tobacco or cotton, we'd be in fine shape, but we've simply slipped through the cracks," laments Tom Thomson. "I have looked into absolutely every possibility for assistance from federal and state programs to help with the cleanup of nearly \$400,000 worth of timber loss from the storm, and there is nothing available to us because the federal government does not consider trees as crops."

A tour of the 1,060-acre tract, which was named the 1997 Northeastern Tree Farm, reveals the devastation caused by the storm. Mr. Thomson's forester has determined that in an area of about 900 acres, 20% of the spruce and fir and 90% of the hardwood trees lost more than 75% of their crowns in areas above 1,800 feet in elevation. The entire live crowns of spruce and fir snapped, while every stem of hardwood is either broken or has sustained damage to the crown.

The only assistance the Thomsons will receive will be from the disaster relief bill signed by President Clinton on May 5, 1998. They will receive 75% of the cost of preparing a management plan under the Stewardship Incentive Program (SIP) or through a special Stewardship practice developed to address ice storm needs. Once a management plan has been completed, funding will be provided through SIP for clearing access roads and trails. For tax purposes, the Thomsons can only claim the portion of the loss that is the undepleted part of their basis in the timberland — this represents about \$158,000.

Tom Thomson's son had just purchased a skidder to go into full-time business harvesting on the Tree Farm when the storm hit. Now Mr. Thomson won't let him into the damaged areas to cut with a chainsaw because of the danger. They began harvesting with a mechanical cutter during the summer of 1998 to salvage the softwood, before it is a complete loss.



**Tom Thomson**



Henry Whittemore

# On the Trails

**T**HE TOURISM & RECREATION industries also suffered losses as a result of wood debris, which covered recreational trails and ski runs on private and public lands. The ice storm left about 200,000 acres of the White Mountain National Forest covered in heavy ice, blocking 850 miles of trails and roads. The Green Mountain National Forest lost access to 257 miles of trails, several trail shelters, and one bridge. Two hundred and ninety miles of roads and trails were closed on state lands in New York. There was also extensive damage to trails that go through private lands, including hiking, snowmobiling, and skiing trails. The state of Maine has 6,000 miles of snowmobile trails — 3,000 of these had significant damage. Partial clearing of trails regionally has been accomplished through dynamic partnerships between the Forest Service, the Appalachian Mountain Club, and numerous hiking, outing, and snowmobile clubs.



**White Mountain Ridge Runners clean up a snowmobile trail.**



**Clearing trails in the White Mountain National Forest.**

Rob Burbank

# In the Sugarhouse

**M**APLE PRODUCERS were hit particularly hard in this storm. Management of a "sugarbush" calls for large trees with big crowns that are widely spaced. This made them more vulnerable to damage from heavy ice. Some producers initially predicted total loss, with Clinton County in New York reporting 100% of lost production. New York estimates \$6.4 million in lost production statewide. New Hampshire estimates that 500-700 acres may not go back into production. Data available from two counties in Vermont indicate that tapholes were reduced by 12,000 in that area.

Most producers will follow conservative tapping guidelines for the next few years. Maple sap production may be affected for years, even decades, as a result of the storm.



Doug Rose

## Doug Rose, Green Mountain Sugarhouse, Ludlow, Vermont

**Doug Rose** has worked in his Ludlow, Vermont, sugarbush since 1970 and has never seen anything like the damage caused by the January 1998 ice storm. "I think a bomb would've been easier, because there would've been just one big hole," said Rose. "It looks like a lawn mower just ran over the trees — the tops are all clipped off."

Rose's Green Mountain Sugarhouse operation normally runs 12,000 taps and makes about 3,000 gallons of maple syrup. After renting new taps off surrounding lands and salvaging what he could off his own sugarbush, Rose was able to produce about 1,200 gallons in 1998.

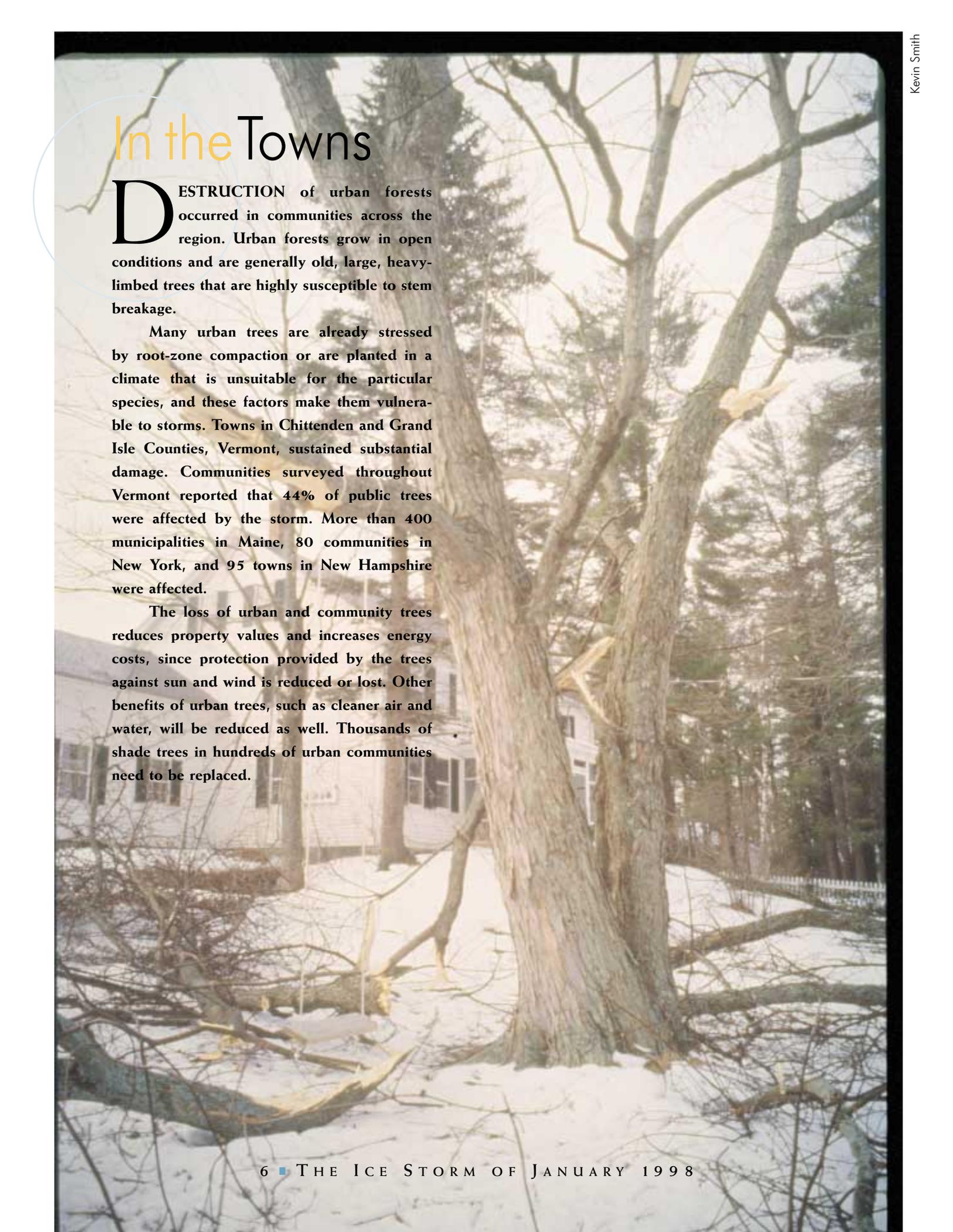
Although the early signs indicated a huge loss, and the sugar maple damage is severe on the 250 acres he taps, Rose's view in the summer of 1998 is a bit different than back in January. "I don't think the long-term damage is going to be quite what we thought," Rose contemplates. "We will lose some taps for good — probably about 300 of the 4,000 on my 86-acre South Reading bush — but it won't be a complete loss," he adds.

Rose has received aid for the cleanup because sugar maple operators are considered "farmers" by the USDA. The Farm Service Agency is cost sharing up to 64% to a total of \$24,000 for the work. Additionally, his business insurance covered the labor and materials to replace \$24,000 worth of tubing, but so far has not agreed to compensate him for the loss of syrup production this year.

Charles Levesque



Doug Rose



## In the Towns

**D**ESTRUCTION of urban forests occurred in communities across the region. Urban forests grow in open conditions and are generally old, large, heavy-limbed trees that are highly susceptible to stem breakage.

Many urban trees are already stressed by root-zone compaction or are planted in a climate that is unsuitable for the particular species, and these factors make them vulnerable to storms. Towns in Chittenden and Grand Isle Counties, Vermont, sustained substantial damage. Communities surveyed throughout Vermont reported that 44% of public trees were affected by the storm. More than 400 municipalities in Maine, 80 communities in New York, and 95 towns in New Hampshire were affected.

The loss of urban and community trees reduces property values and increases energy costs, since protection provided by the trees against sun and wind is reduced or lost. Other benefits of urban trees, such as cleaner air and water, will be reduced as well. Thousands of shade trees in hundreds of urban communities need to be replaced.

## The City of Augusta, Maine

**On the morning** of January 8, 1998 the people of Augusta, Maine, awoke to find their city covered in ice and their community forest smashed and broken. Fortunately, an arborist had been hired by the city 18 months earlier. Dave Gomeau had spent that time doing basic tree care, assessing Augusta's municipal trees, preparing a community forest management plan, and forming strong mutual partnerships with different public and private groups, including the highway department, parks and recreation, and Central Maine Power. Little did he realize what an important role these partnerships were going to have on the ability of the city to recover from the storm.

Gomeau's estimate to FEMA for repairing, removing, and cleaning up the trees was \$250,000. "Knowing how depressed the city residents were, we began working in front of the library, which is in the center of the community," said Gomeau. By May 1st there was very little sign of the storm's devastation. The city repaired 3,000 trees and removed only 168, which Gomeau had targeted for removal well before the ice storm. To maintain the desired 45% canopy throughout the city, 63 trees have been planted since January, with a year-end goal of 75.

Gomeau says repairs to the community forest and additional work in outlying areas could push the city's federal funding to \$70,000 or more. The city of Augusta initiated a timely response to the crisis because of the lead work citizens had done beforehand. Dave Gomeau says, "A very important component of a sound community forest management plan consists of strong relations and partnerships with not only the different community departments but also with as many private corporate businesses as possible."



Farmingdale, Maine

Gordon Chibroski

# A Quick Response

**S**TATE AND FEDERAL forestry agencies assembled quickly to strategize a response to the disaster. Representatives of the four state forestry agencies met with the USDA Forest Service, Northeastern Area State and Private Forestry, to develop a strategy for delivering assistance. The Forest Service provided \$800,000 to help the states assess damage and make plans for recovery and restoration. The Federal Emergency Management Agency (FEMA) also worked closely with state and federal forestry management agencies and made funds available for immediate needs.

Each state and National Forest assessed damage in the days and weeks following the disaster. Airplanes and helicopters flew over suspected areas of damage, while foresters made notations and sketches on maps. Snow cover on the ground and the light color of the damaged trees made assessment from the air especially difficult,

but a "footprint" of the storm emerged and the location, severity, and pattern of the damage was mapped.

Forestry personnel in all states spent many weeks providing advice to landowners and industry, attending community meetings, and being interviewed by media. The Forest Service compiled general and technical informational packets for distribution. The main message to forest landowners was "Be safe, don't panic, get professional help" before salvaging damaged trees too quickly. They were advised to wait until spring to conduct a damage assessment, when there would be less chance of removing a tree that has the potential to recover. Landowners and loggers were also advised to use safety precautions when walking or working around storm-damaged trees.



## Ice Storm 1998

Information Sheet #8 February 27, 1998  
USDA Forest Service, Durham, NH



### Helping Trees Recover From Ice Storms

The unprecedented ice storm of 1998 damaged forests and urban trees throughout New York and northern New England. Ice coatings of up to several inches thick added tons of extra weight to individual trees. Stems and branches broke, while some trees were completely bent over. Hardwoods appear to be affected most, from young trees to mature trees with large crowns. The ice storm killed some trees, but many of those that are damaged can survive. There are some things that can be done to help damaged trees recover.

***Caution:** Homeowners working on their trees need to use extreme caution. Removing large trees or limbs can be dangerous. Do not climb a ladder with a chain saw, do not climb into a damaged tree, and never touch any tree near electrical wires. Assess your particular tree situation carefully and watch for safety hazards. Most tree work needs to be done by professional arborists, especially when the work requires climbing or the tree is leaning against another tree or structure.*

**Assess immediate hazards first:** Remove dead trees, trees or branches that are leaning, trees with broken or cracked stems, trees with extensive broken roots, and any large, dead, or broken limbs that are still attached to the tree. Landowners of large acreage may want to wait until a damage assessment has been completed before salvaging forest stands. Over time damaged trees may have a higher incidence of decay and discoloration.



**Hire an arborist:** Hire a qualified arborist to get the work done properly and safely. Trained arborists are aware of proper pruning and removal procedures and can reduce the chance of further damage to the tree. Check to see that they are certified and ask for certificates of insurance, including proof of liability for personal and property damage and worker's compensation. Also, request local references and get more than one estimate.



## Ice Storm 1998

Information Sheet #1 March 3, 1998  
USDA Forest Service, Durham, NH



### How To Determine Percent Live Crown Loss In Hardwoods Before Leaf-Out

This guide will help in assessing the impact of ice damage to hardwood trees. With this initial assessment, consultants and landowners will be able to identify individual trees and stands that need to be revisited after leaves emerge. Determining the consequences of the ice storm will require periodic monitoring of tree response and external indicators of infection such as decay and discoloration fungi.



**Tree damage and potential for survival is related to the extent of loss of the live crown.**

Discolored and decayed wood that results from wounding and infections will take one to many years to develop. Little additional loss of wood quality is expected in the first year following the damage.

Safety considerations require prompt removal of hazardous trees and branches. Once those are removed, hastiness to harvest other damaged trees may result in more damage to residual trees, leading to decreased timber values over the long term.

(over)

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*Don't Panic! Stop, Think and Be Patient.  
Safety First and Foremost.  
Get Professional Advice.*



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or check our website:  
[www.nena.org/NA\\_Home](http://www.nena.org/NA_Home)

**The USFS, S&PF, provided timely technical advice to managers and landowners with a series of Fact Sheets.**

# An Emergency Appropriation

**E**STIMATES FOR RECOVERY from the storm exceeded \$50 million. The congressional delegation responded in a bipartisan effort to secure funds, and President Clinton signed a \$48 million appropriation on May 5, 1998 to help Maine, New Hampshire, New York, and Vermont recover from the ice storms of January. Money is coming through regular programs of the Forest Service, which are administered by state agencies. The Stewardship Incentive Program (SIP) makes cost-share funds available to private landowners to have a forester evaluate their storm damage or write or revise a plan for managing their forest. Once the plan is completed, landowners can receive money to help cover the cost of forest and trail clean-up, reduce fire danger, remove hazards, improve their forests, and complete other activities related to the ice storm. Landowners may receive up to a maximum of \$10,000/year for recovery practices under SIP. Close to 1,000 landowners have requested assistance from this program since the storm occurred.

Urban and Community Forestry funds allow communities with damaged or destroyed trees to apply for cost-share funds to assess the damage, inventory existing trees, make restoration plans, and carry out tree planting and maintenance programs. The Northeast Center for Urban and Community Forestry at the University of Massachusetts, Amherst, is coordinating efforts and disseminating materials among the states.

Communities and businesses can apply for funds under the Rural Economic Development Program. The money can be used for innovative uses of storm damaged wood. Some of the funds are earmarked for local fire departments to locate areas of increased fire danger due to storm debris, and to purchase equipment to cope with the increased risks.

Forest Health Management funds will be used to re-measure forest plots that were damaged by the storm. These plots provide foresters with information about the health of the forest, how well the trees are growing, and



Bill Froment

**Forest Health Management Program survey worker, White Mountain National Forest, NH.**

what species of trees are present. The Forest Service will also set up plots to study the long-term effects of the storm, since damaged trees may be more prone to diseases and insect problems.

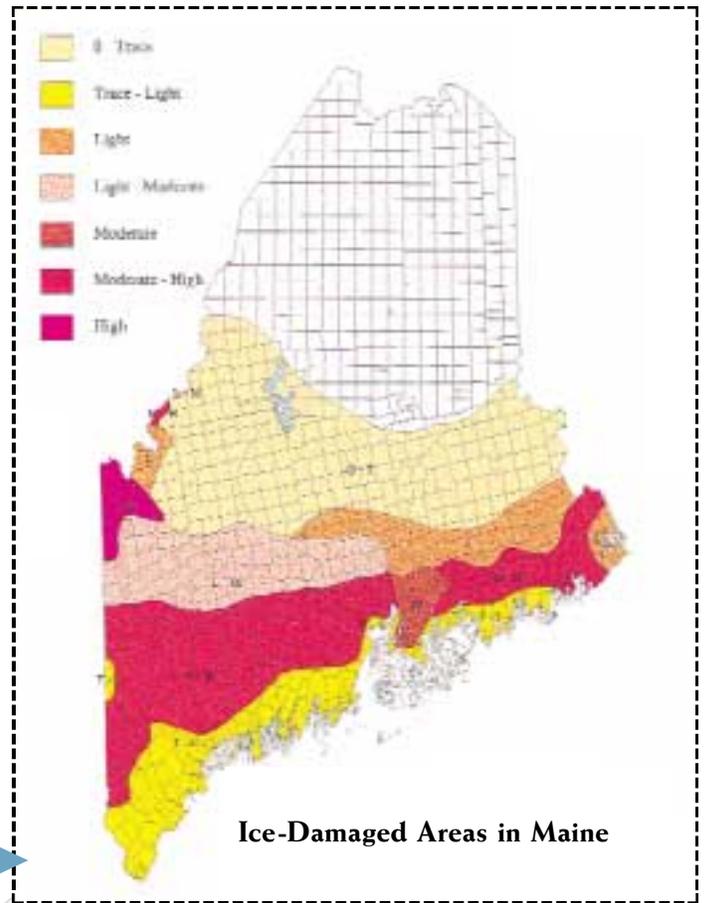
## DISBURSEMENT OF PRESIDENT'S APPROPRIATION

Maine	\$25 million
New Hampshire	\$6 million
New York	\$8.5 million
Vermont	\$4 million

All states named an Ice Storm Recovery Coordinator and the Forest Service has established an Ice Storm Recovery Team in Durham, NH. These individuals are now disbursing funds that are helping communities and individual landowners recover from the storm. The following pages offer a summary of some of those activities.

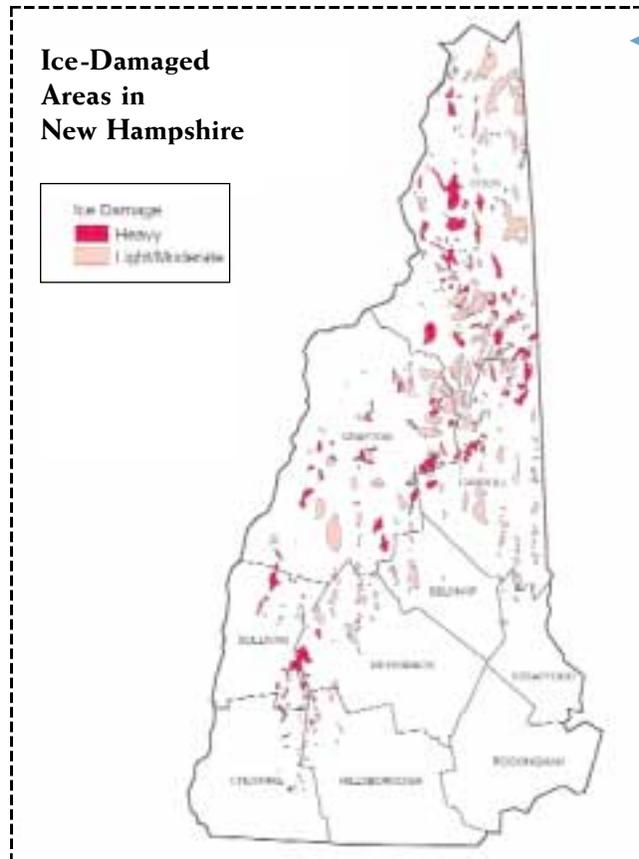
# State Recovery Activities

**Maine.** The storm damaged over 11 million acres in Maine, and all 16 counties were declared disaster areas. The Maine Forest Service has flown over 2½ million acres to photograph the damage in large-scale, high-resolution photography. These photographs are available to landowners, planners, municipalities, and other groups. Maine is participating in all the regional assessment and monitoring programs. Workshops are planned for foresters, arborists, nurserymen, and landscapers on diagnosing and managing ice storm related tree health problems, hazard tree identification, and damage assessments. The state is working with Cooperative Extension, the Farm Service Agency, and other partners to provide technical assistance to landowners, institutions, and homeowners. Over 200 professional forestry consultants have been trained in ice storm-specific management practices. Over 1,400 individuals have called a toll-free number for assistance. The Maine Forest Service has assisted 16,000 people in a technical capacity.



Maine Forest Service

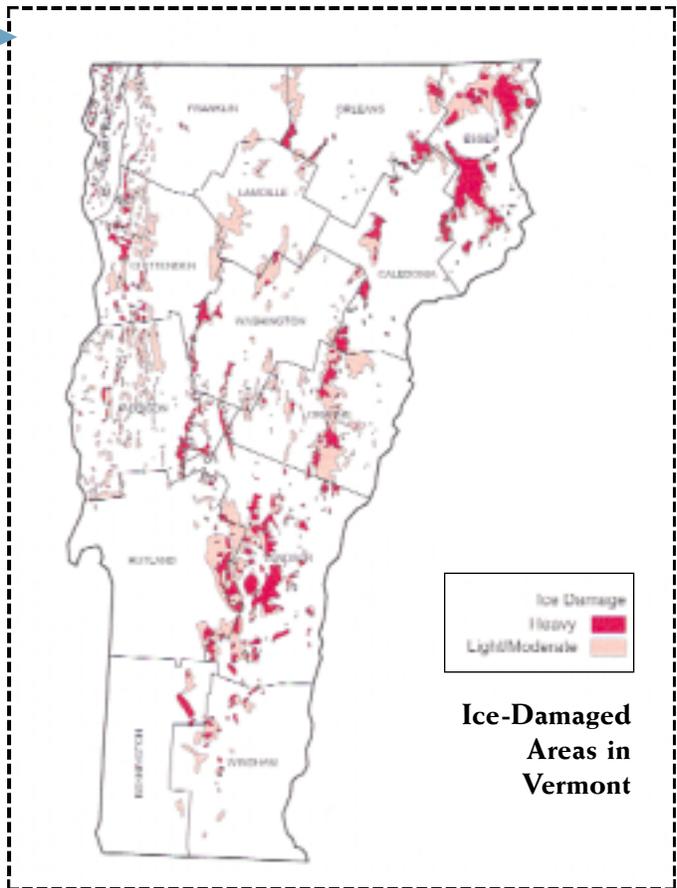
Forest Health Protection GIS Group, NA S&PF, Durham, NH



**New Hampshire.** The storm damaged 700,000 acres in New Hampshire, including parts of the White Mountain National Forest. Nine counties were declared disaster areas. The state has established an ice storm recovery center, staffed by Cooperative Extension personnel, which can be reached by phone, fax, or the internet. New Hampshire is participating in all the regional assessment and monitoring programs. The state is developing a community grants program in the nine ice storm-affected counties, where 95 communities are potentially eligible for funding. Cooperative Extension is building a landowner database in the affected areas. Restoration will be examined on an individual parcel and landscape level, with several special SIP cost-share practices implemented. New firefighting equipment will be purchased for rural towns in affected areas. The state will also work with forest industries on development of new markets for ice-damaged trees.

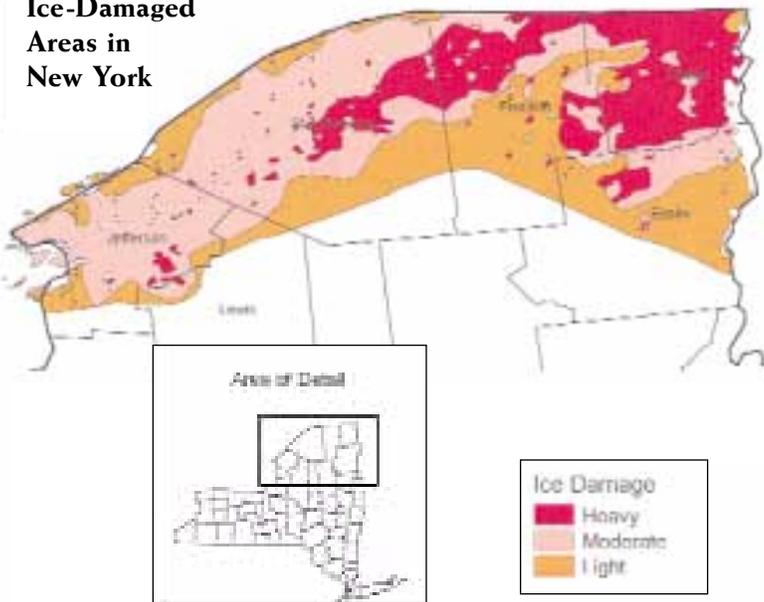
## Vermont.

The storm damaged 944,000 acres in Vermont, including portions of the Green Mountain National Forest. Five counties were declared disaster areas. Vermont is participating in all the regional assessment and monitoring programs, as well as conducting the Vermont Hardwood Project. Handouts and workshops are being provided for landowners and natural resource managers. The state is providing technical and financial assistance to affected communities to update existing tree inventories or develop new ones. Vermont has a target of 200 new or revised plans under SIP. Rural fire departments will receive funds, technical assistance, and training to help them locate areas of high potential fire risk and determine how to mitigate them.



Forest Health Protection GIS Group, NA S&PF, Durham, NH

## Ice-Damaged Areas in New York



## New York.

The storm affected 4.6 million acres and significantly damaged 3 million acres of forests and communities in New York. Six counties were declared disaster areas. Six temporary foresters will be hired under the Stewardship and Urban and Community Forestry programs, and two will be available to provide SIP technical assistance. Most of New York's funds will be passed through to third-party grantees, including Cornell Cooperative Extension, the State University of New York College of Environmental Sciences and Forestry, the Adirondack Economic Development Council, and individual cities and towns. The state is participating in all the regional assessment and monitoring programs. Wildlife and non-woody

plants will also be studied. Community street tree workshops are being held throughout the state. SIP money will be directed to revision of existing plans and preparation of new ones. A marketing and utilization forester will be hired to help forest businesses recover from the storm and to make effective use of storm-damaged material.

Forest Health Protection GIS Group, NA S&PF, Durham, NH

# Future Needs



Doug Rose

**I**T MAY TAKE a decade or more to determine the full impact of the ice storm on the forests and communities of northern New England. Federal monies made available through state forestry agencies will provide relief to many forest landowners, but the needs of some will not be met and there are gaps in relief funding that need to be filled. The federal government issued a report in February 1998 entitled "A Blueprint for Action," which details these gaps and suggests a strategy for filling them. NEFA endorses this report and offers the following additional suggestions:

■ **THE STEWARDSHIP INCENTIVE PROGRAM (SIP)** helps landowners cost-share forestry work that is outlined in their multi-resource forest stewardship plan. SIP should include special practices to assist forest landowners to recover from natural disasters. These would include fire hazard reduction, hazard tree removal, and clearing debris from roads, ditches, culverts, and trails.

■ **THE USDA FOREST SERVICE**, with an agreement from the State Foresters, could hold a portion of the SIP appropriation in a special emergency account. These funds could be made available through state Farm Service Administration offices within two weeks following a natural disaster.

■ **SIP SHOULD CONSIDER THE NEEDS** of large landowners that must use the entire emergency allotment of \$10,000/year to pay for a revised management plan, and have no funds remaining for debris removal and salvage.

■ **FARM SERVICE ADMINISTRATION SHOULD CLASSIFY** timber as an agricultural crop. This would make landowners eligible for crop insurance payments and other emergency programs.

■ **TRAINING PROGRAMS ARE NEEDED** for communities, homeowners, and utilities in proper placement, planting, and pruning of municipal trees.



Tom Thomson



Doug Rose

## WHO TO CONTACT FOR MORE INFORMATION

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**NEFA'S MISSION.** To encourage sound decisions about the management and use of forest resources in the NEFA region by identifying significant regional trends, broadening awareness of forest health and sustainability issues, providing a regional context for state and local decisions about forest resources, and analyzing the environmental, social, and economic impacts of forest land use. NEFA seeks to accomplish this mission through the development of high quality information about the region's forests and acting as a forum for presentation and discussion of these issues.

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*Front, back & inside cover photos: Tom Thomson*