



Hands-on Series: Caring for our Forest



Homeowner's Guide

Maintaining Your Trees Following Ice Storms
and How to Prevent Future Damage

1

Benefits of Urban Trees

Trees provide numerous benefits to you as a homeowner and to your neighbourhood. They clean the air, filter our water, help save energy (by shading homes during the summer and sheltering from wind in the winter), contribute to biodiversity, store carbon and provide aesthetic value. Urban trees can also have a variety of health benefits, including reductions in stress and a lower risk of diabetes and lung disease. Healthy, mature trees can also increase the value of the average home by more than \$19,000.

Unfortunately, trees are susceptible to severe weather, including ice storms. In urban areas this means that storm damage to trees also directly affects people. The following is a guide to help you learn how to deal with trees that have been damaged by severe ice storms and how to invest in ongoing tree care to help you avoid property damage in future storms. Additional details and more information are available on the Forests Ontario website at www.forestsontario.ca.

2

How Ice Storms Can Damage Trees

The recent experience in the December 2013 ice storm that hit Ontario is just one example of the dramatic effect that ice can have on trees, resulting in the loss of branches, split trunks and in some cases even uprooted trees. A loss of foliage due to broken branches, the weakening of the trunk and/or damage to the root system can all impact the ability of a damaged tree to grow and make trees more susceptible to insects, disease and additional damage in the event of future storms.

Recovery depends largely on the initial health of the tree and the extent of damage incurred. Healthy trees with minimal crown loss (upper branches) should recover, and over time, the crown may even appear normal. Even trees that appear to be severely damaged may also recover with proper care. For a better indication of what to expect in terms of survival and recovery please see the following sections.



3

Helping Your Trees Recover

Safety First

- Use caution when approaching, inspecting or caring for a damaged tree. Trees should only be inspected when there is no chance of personal injury. Suspended branches and split trunks can pose a significant safety risk and broken branches that appear wedged in upper branches can fall without warning, resulting in serious personal injury or property damage.
- Do not approach, attempt to take down, or prune trees that are close to power lines.
- Removing or pruning large or heavy branches is difficult and should only be carried out by trained and experienced professionals. Similarly, if the tree is large and requires work that cannot be performed from the ground, or if extensive chainsaw work is required, you should contact a qualified professional.
- Proper safety equipment should be worn when pruning any tree (i.e. safety glasses, hard hat, steel-toed boots, etc.).
- If there is severe damage or a potential safety issue, or if you are uncertain as to how to proceed, call a professional. When hiring a professional make sure that they have the proper qualifications and insurance. Verify if a tree professional's qualifications by contacting the International Society of Arboriculture, Ontario Chapter, at 1-888-463-2316.

Assessing Your Trees (Survival and Recovery)

The chance of survival and recovery of a tree depends largely on the type and extent of damage sustained. Major types of damage to be assessed typically include: (1) loss of crown/branches, (2) bending of the stem, (3) split trunks, and in severe cases, (4) uprooting of the tree.

The following provides a general indication of what you can expect in terms of survival and recovery following various types of damage:

SPLIT TRUNKS

Trees with split trunks are unlikely to survive, although in some cases, the tree may be saved with appropriate care if the split is not too extensive. Addressing split trunks can be a complex and dangerous procedure. Contact a professional for an assessment and proper care and/or removal.

Crown loss

(Modified from the LandOwner Resource Centre Extension Notes—Caring for Ice-Damaged Trees)

Loss of Crown	Expected Outcome
0-25%	Little to minimal effect on the tree
26-50%	Very likely to survive, recovery may take several years
51-75%	Fair chance of survival, recovery may take several years
> 75% crown loss	Low chance of survival, however, may survive depending on the species

Bent trees

(Modified from the LandOwner Resource Centre Extension Notes—Caring for Ice-Damaged Trees)

Degree of bend in stem	Expected Outcome
< 20-degree bend	Will survive and recover
< 60-degree bend	Good chance of survival and recovery
> 60-degree bend	Low chance of survival and recovery

UPROOTED TREES

It may be possible to straighten small or medium sized trees that have been partially uprooted, provided that at least one-third of the original root system is still in the soil and the remaining exposed roots are relatively compact and undisturbed. Larger, more mature trees do not typically survive attempts to pull them back into place. If uncertain, you should contact a professional for an assessment.

Caring for your Damaged Trees

PROPER PRUNING

Be certain to use the proper tools and safety equipment (i.e. safety glasses, hard hat, steel-toed boots, etc.) when pruning any tree. Chainsaws should only be used to remove the larger portion of storm damaged limbs. Use smaller pruning tools (i.e. hand saws, pruning poles, etc.) for smaller branches and the smaller portions of larger limbs.

Proper pruning of broken branches is critical to a damaged tree's recovery as improper pruning can result in further deterioration.

Branches that have been pruned correctly will form a large callus to seal the wound. If removing branches, do not cut into the collar that has formed at the base of the branch (the collar is the raised ring of protective tissue circling

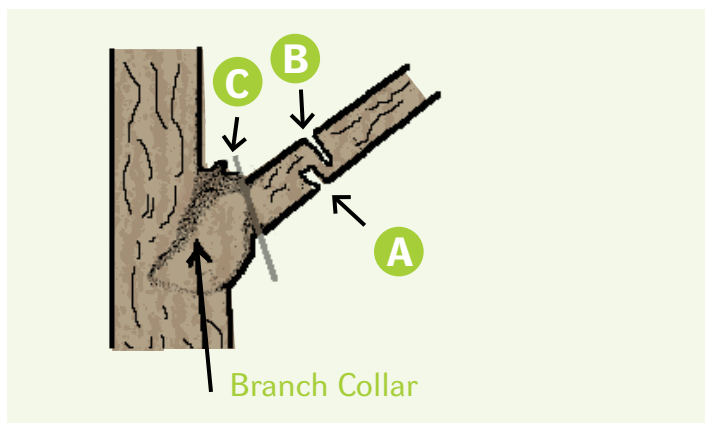
Clean Tools to Prevent the Spread of Disease

Diseases can be spread by tools that have been used to cut an infected tree. Pruning tools can be sterilized using a mixture of one-part household bleach to 10-parts water.

the branch and acts as a barrier to further decay). Trimming above the branch collar will result in a wound that closes quickly and completely. Try not to leave a long broken stub as this will prevent the wound from healing quickly and will encourage fungus and insects. Do not prune flush to the main stem as this creates a large hole that will be slow to heal.

Cut larger branches using a three-step method—two cuts to remove the weight of the branch and to prevent tearing the bark below the limb, and a final cut to help allow for proper healing (see Figure 1). Make the first cut (A) two feet from the trunk. Cut half way through the branch, moving from the bottom (underside of the branch) up. The second cut (B) is one-third to half the diameter

Figure 1. The three-step method for pruning trees.



of the limb away (further from the trunk) from the first cut. Cut half way through the branch from the top moving down. At this point the limb should fall away under its own weight. The final pruning cut (C) is next to the trunk. Cut outside the branch collar with the lower edge of the cut being further away from the trunk of the tree.

If the job looks too large or dangerous, hire a professional.

If the stem of a tree has snapped on its own during the storm and most of the crown has been lost, there is still a chance that the tree may survive. In such cases, the stem should be cut at a 45 degree angle below the break in the stem and above the next branch that is at least one-third the size of the stem. This will prevent water from pooling and rotting the trunk.

PRUNING YOUNG CONIFERS

The tops of young conifer trees are often bent or broken off during ice storms. In such instance, you should conduct corrective pruning. Cut the broken or bent tops just above the first live whorl (group of healthy branches). This will encourage a branch in the top whorl to become the new leader. Find the best branch and gently bend it upwards. Use a biodegradable material (cotton, linen, etc.) to attach the selected branch to a pole that is tied to the tree's trunk; the use of plastics or metals can further damage the tree. This should straighten the branch and encourage it to become the new leader.

CARING FOR TORN BARK

During ice storms and other severe weather events, broken branches will often tear and strip off bark making the tree more susceptible to disease and the invasion of insects. To repair torn bark use a chisel or sharp knife to smooth out any ragged bark around the edges of the wound and remove all loose

or hanging bark to the point where it is firmly attached to the tree. Shape the wound into an ellipse, as the rounded ends will prevent dieback of the inner bark, making sure to keep the wound as small and narrow as possible.

SPLIT TRUNKS

As noted above, dealing with split trunks is complex and dangerous and should be left to qualified professionals for proper care or removal.

UPROOTED TREES

It may be possible to straighten small and medium sized trees that have been partially uprooted. Before straightening the tree, remove some of the soil from beneath the root mass so that the roots will be placed below the existing grade level. Trees should be gently pulled back to their original position and staked until the roots can become re-established. Soil should be firmly packed around the roots and watered well if seasonally appropriate.

When to Take Action

There is no rush to remove trees that do not pose a safety hazard. If possible, wait until the growing season (between bud burst in the spring and bud formation in the fall) before deciding to take down damaged trees. Trees are resilient and have an incredible ability to recover from storm damage. While damage to some trees may seem severe at first, the damage may not be as bad as initially believed. Damaged trees may continue to serve the purpose for which they were planted, and with a little patience and care, many damaged trees can recover.

Although caring for damaged trees can occur at any time of the year with few exceptions, Table 1 provides some seasonal care and maintenance advice.

Benefits of Investing in Ongoing Tree Care

One of the best ways to avoid future storm damage is to ensure trees are healthy. Therefore, take appropriate steps to ensure the trees on your property are healthy and receive proper maintenance on an ongoing basis. Trees are an important part of your property investment, and just as you wouldn't neglect your roof you shouldn't neglect the trees in your yard. A bit of care and maintenance over the year can reduce your trees' susceptibility to ice storms as well as other potential harmful agents such as insects, drought and disease.

As noted above, trees provide a number of ecological, social and economic benefits, and a healthy, mature tree in your yard can have a notable impact on the value of your house.

The following table (Table 1) provides some tips on how to care for your trees on an ongoing, seasonal basis.

Table 1. Seasonal advice for maintaining healthy trees on your property.

Spring/Summer

- For young trees, the best time to apply mulch is mid-spring when the soil temperature has warmed up enough for sufficient root growth. If applied earlier, the mulch will keep the soil temperature low and root growth could be delayed.
- Mulch should always be applied when new trees and shrubs are being planted.
- Late summer is a good time to observe the upper branches of hardwood trees and to look for any dead branches or die-back of leaves. These are potential signs of declining health and it would be useful to have a professional do an assessment of the tree's health.
- Hardwoods that flower in early spring should only be pruned after flowering occurs and before buds form in the fall to ensure that the flowers will bloom again next spring.
- Avoid pruning hardwoods in the spring as flowing sap will attract insects.
- Pruning defective limbs can take place during the summer when they can be more easily seen (as limbs often hang down under the weight of the leaves).
- Unless there is a safety hazard, trees should be taken down and removed only during the growing season (between bud burst in the spring and bud formation in the fall).
- If you have ash trees on your property (excluding mountain ash), you should be looking for signs of the Emerald Ash Borer (EAB), an insect that is killing our native ash trees. This insect can kill a mature tree in two growing seasons. Some of the first signs of trouble may be seen in late summer. Look for dieback in the upper crown and/or sprouts coming from the base of the trunk. More difficult to spot is the May to June emergence of adult insects which leave a "D"-shaped exit hole in the bark, roughly 1/8 inch in diameter.
- If you have ash trees that show little to no EAB infestation, you may wish to treat your trees. The treatment that has shown to be most effective in protecting ash trees is called TreeAzin. This treatment should be timed with the emergence of adult EAB (May to late June) and must be applied by a qualified professional.

Table 1. Seasonal advice for maintaining healthy trees on your property.

Fall/Winter

- Trees are fairly brittle in the winter, so following a storm be sure not to remove ice and snow from branches with a blunt object, such as a shovel.
- If your tree becomes bent due to ice build-up, allow the ice to thaw before you attempt to straighten it.
- Fall and winter are good times to observe your trees for signs of defects, woodpecker damage, loose bark, dead branches, lichens and fungal growth—these are all signs of tree decline and decay.
- Unless there is a safety hazard, trees should be taken down and removed only during the growing season (between bud burst in the spring and bud formation in the fall).
- Trees are resilient and individual trees that appear to be severely damaged during ice storms may recover. Where safety is not an issue, you may find that leaving the tree standing will give it time to recover.
- Pruning during fall and winter is the most common practice. It results in a vigorous burst of new growth in the spring and should be used if that is the desired effect. However, avoid pruning during the coldest part of winter.
- Trees and shrubs that flower in mid- to late summer should be pruned in winter or early spring.

TIPS FOR PLANTING NEW TREES

Some species are more susceptible to damage than others. Typically, faster growing species, such as birches or poplars, are not as structurally sound as slower growing species, such as native maples or oaks. As a result, faster growing species are more susceptible to damage from high winds or ice accumulation, which typically accompanies ice storms. When you plant new trees consider slower growing, more durable species because they have longer life spans. Slower growing trees usually offer better overall value to your property; they provide more shade, lower energy costs and stay healthier longer.

When planting new trees also consider the following:

- Plant your tree in an area where there is adequate space for the roots to grow, newly planted trees should be a minimum of two metres from hard surfaces, such as driveways
- Do not plant trees under hydro wires
- Plant trees where their growth won't be impeded by other trees
- Plant trees with enough space around them so that they won't interfere with fences, decks or the foundation of your home when they mature
- Make sure newly planted trees are mulched and well watered

CLIMATE CHANGE, ICE STORMS AND TREES

Climate change is expected to increase the frequency of ice storms in Ontario, most notably in the northern parts of the province. As a result, increased damage to trees may follow. In addition, warmer temperatures could result in an increase in the number of invasive species and drier growing seasons, both which would have a negative impact on trees.

For more tips on how you can help minimize the impacts of climate change on urban trees, visit the Forests Ontario website at www.forestsontario.ca.

Resources

The information in this booklet was adapted from the following resources, all of which can be accessed from the Forests Ontario website —www.forestsontario.ca:

Extension Notes—Caring for Ice-Damaged Trees (LandOwner Resource Centre)

Possible impacts of climate change on freezing rain in south-central Canada using downscaled future climate scenarios (Natural Hazards Earth Science System Sciences—Volume 7)

Tree Survival 15 Years after the Ice Storm of January 1998 (United States Department of Agriculture)

Trees for Life—52 Tips to Double Our Urban Forest

MoneySense Magazine (September 2013)

Climate Change in Ontario (ISA Ontario)

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