



# TREES & THE LAW

BY JULIAN DUNSTER

## Perceptions of risk

Location, potential damage to life and property are factors to consider in assessment

Quite often, people perceive tree risk based on nothing more than irrational fear. Some of this is the realization that if the tree(s) did fall they almost certainly would cause major damage and/or serious injury. Some of it is a reaction to press coverage. Being killed or injured by a falling tree has some novelty value compared to deaths by crime, car accidents or cancer, for example. However, despite many annual storms, the number of people killed by falling trees is extremely low. So low, in fact, that it can hardly be plotted in comparison to the many other risks that can kill us.

Consider that there are about 307 million people in the United States. Last year I tracked 58 deaths in the U.S. caused by trees falling on people. That excludes loggers and others cutting trees or working around trees. These

falling trees is even lower since we do not get as many hurricanes and severe storms. In Great Britain, with a population of around 61 million living on a relatively small piece of land, the annual deaths due to falling trees seem to be around seven to ten a year or around one in six million. The chances of being killed by a falling tree (or part of it) are incredibly small.

This extremely low number of deaths could be a result of several factors:

a) Risk assessment programmes in North America or Great Britain are very successful and have eliminated most of the extreme risk trees. Most people live in densely populated areas where extreme risk trees have generally been removed. Risk reduction programmes could be one factor. But the vast majority of the land



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*The perceived risk of tree failure leading to damage or injury varies between the lay public and skilled risk assessors.*

deaths were simply people driving along roads, walking in the woods, or working outside, all minding their own business. All but one of these deaths occurred in storms. Those numbers represent about one in 5,293,103 so let's say one in five million. In the U.S. in 2005, 2.9 million people were injured in car crashes, and an additional 42,636 died. That's about 117 deaths per day, almost five per hour, or a risk of death at one in 7,200.

In Canada, even after allowing for the difference in our populations, the mortality rate due to

base lies outside places where a regular tree risk assessment programme is in place.

b) Most fatalities take place in storms and, usually, most people are sheltering during such weather. This seems likely to be one factor, although there are cases where apparently mild weather conditions topple trees. Tree failures in that category have probably been seriously weakened prior to failure.

c) Tree are actually fairly safe structures and they stand up well in many conditions, even though all of them will eventually fall

down. Although press descriptions of accidents do not record the details about the trees, photographs often show that not all of the fallen trees exhibited massive defects, and not all of them were dead at the time of failure.

It is common to see major storms toppling large healthy trees in urban and rural areas. A post-failure examination of these trees is instructive to see if there were obvious structural problems that could have been detected in a standard visual assessment. Sometimes issues are apparent and would have been picked up had an assessment been undertaken. In other cases there are no

external indicators of the internal structural problems, and occasionally there are no problems at all; the tree was simply blown down by extreme weather conditions.

Given that the odds are so low, risk managers need to consider what an acceptable level of risk might be. For cities and urban areas in general, there are clear societal expectations that the trees on public lands are, or should be, relatively safe. In this sense, the risk manager will usually be considering an acceptable level of risk based on normal weather conditions, not when a hurricane is roaring by. In urban parks, the same standard would usually apply. As we move further away into suburban areas, and then onto rural lands, the extent of the public land base may be much larger, and the level of assessment will be less simply because it is not possible to examine every tree in every location. In these areas, the level of acceptable risk may be higher. Of course, the highest use areas such as main parking lots, high traffic trails, and major roads through the parks ought to be assessed more rigorously because these places are where the greatest number of people will be found. As with many other risk issues, there are no absolute rules dictating what an acceptable level of risk is. Descriptions are almost always qualitative, not quantitative. However, the risk manager still needs several key components in the management strategy. Firstly, there needs to be a policy that

explicitly recognizes the potential problems that may arise as a result of trees falling. That policy is the basis for a due diligence programme. Secondly, there needs to be a budget that enables the risk manager to find out what the present condition of the trees is throughout any one area. Next, there needs to be staff who have the skills to assess tree conditions and report back. Finally, there needs to be a procedure for dealing with trees that are considered to be too risky to retain any more. In all cases the implementation of the risk assessment programme must be thorough and complete.

In most areas, trees growing on private lands also have the potential to fall onto people or property. Defining an acceptable level of risk on private property is less simple, because very few private landowners are aware of the risks associated with their trees, and most lack the technical skills to assess risk. While public landowners seem to be expected to actively and effectively manage risk issues, private landowners are often not held to the same standard. There may be occasions where the private landowner manages a park or garden, or hosts an event on their lands, and it is prudent for the landowner to assess these areas for tree risk issues beforehand.

The perceived risk of tree failure leading to damage or injury varies between the lay public and skilled risk assessors. The perceived risk level also varies among assessors because risk assessment

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*Trees and the Law continued*

protocols depend on experience, training, education, and the decisions made by each person. Generally, most people can agree about the risk of a tree that is clearly about to fall down. Perceptions of risk are more likely to be divergent when the tree's condition is less obvious. It may have several obvious defects or external indicators of possible internal problems, but whether or not these are really important can be much harder to decide.

Ultimately, deciding on an acceptable level of tree risk is entirely dependant on the owner's willingness to see risk issues as a whole, and compare them to other issues. The track record of tree risk and fatalities is extremely low compared to other much more common activities, such as driving a car. Consequently, implementing a risk assessment programme that focuses on detailed assessment in high-use areas as a priority, and a more general level of assessment in lesser-used areas as time and money permit, can be an effective way to manage risk. Risk assessors should always be aware that it is their job to assess risk and report on it. It is the risk manager's job to decide what actions to take, and define how much risk can be accepted.

**ACCIDENT REPORTS**

## Improperly configured control leads to amputation

In February 2009, an employee of a firm in Langley, B.C., amputated his thumb and finger while operating a log splitter. The splitter was fabricated about twelve years prior to the accident.

According to the Work Safe BC accident investigation report, the lever when pushed should have lowered the ram. Pulling the lever should have raised the ram. However, the control was oriented to be operated with movement to the right and left. It also had a detent feature that allowed the lever to be locked in place. This circumvented the "dead man" feature that would default the control to a retract position.

Work Safe BC also noted that the controls were at face level, creating another hazard if the lines failed.

The employer was directed to remove the log splitter from service until the safety guidelines were met. It was also stated: "The employer has not provided the workers with adequate instruction on the safe use of a log splitter."

**ACCIDENT PREVENTION**

## Hydraulic hazards

### Pressurized fluid can cut flesh like a laser

"You wouldn't believe the mess to a hand when there is a pin hole in a hydraulic line," says Kevin Reilly, hydraulic specialist for Princess Auto in Whitby, Ontario, discussing hydraulic accidents. "I believe you don't even feel it. It cuts like a laser. Never check for leaks with your hand or even with a glove. Use a board, or something else." The hot oil is streaming from the hole often at 3,000 psi. "It happens so fast."

"If the log splitter is assembled correctly you have to stand back when the ram boom is extended or lowered." In his shop, Reilly demonstrates how a correctly installed "dead man" lever works. Not only are hands and feet clear of the active area, but the operator is standing well back if a line is ruptured.

There are other types of injuries from hydraulics. In a research paper on hydraulic safety, Colorado State University says fluid from a pin hole "can be injected into the skin as if from a hypodermic syringe. Immediately after the injection, the person experiences only a slight stinging sensation . . . By the time a doctor is seen, it is often too late and the individual loses a finger or the entire arm."

A third hazard is poor coupling. Ruptures occur. Spewing hot oil can cause burns, bruising, abrasions, and fire. There is an excellent article with diagrams on the positioning of hydraulic lines at <http://www.hydraulicspneumatics.com/200/Issue/Article/False/6576/Issue>. Advice in the article includes the following points to consider when installing/replacing hydraulic lines:

- allow for contraction and expansion of the lines;
- bend the line in only one plane—twisting a high pressure hose at five degrees can reduce service by 70 per cent, while a seven degree twist can reduce service by up to 90 per cent;
- prevent external damage with covers or guards;
- allow for movement;
- use non-conductive hose if you are working near power lines or flammable liquids.

*"You wouldn't believe the mess to a hand when there is a pin hole in a hydraulic line."*



Kevin Reilly, a hydraulic specialist in Whitby, Ontario, demonstrates a "dead man" or hold-to-run function. The operator's hand has to be on the control when the ram is in the down stroke.

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