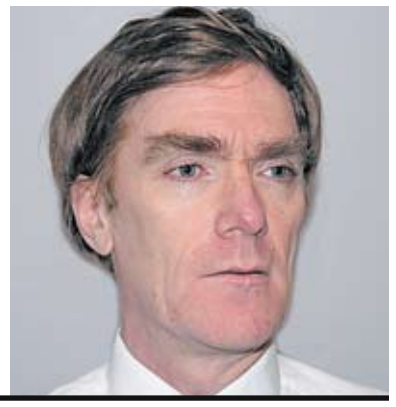
Trees & the Law



BY JULIAN DUNSTER

Dealing with Uncertainty

Since uncertainty is inevitable, it is best dealt with by recognizing its existence and incorporating it into the risk assessment process

Risk assessment is future based. It aims to predict which trees, or component parts of any one tree, will fail within any one time frame. Prediction of future events is seldom simple. We can say with certainty that all trees will fail and fall; they always have and they always will. There is much less certainty about when this event will happen, and under what circumstances.

Estimating probability of failure relies very heavily on the knowledge, training, and above all, experience, of the assessor. Extensive training and knowledge is a starting point. New research and better knowledge is constantly emerging, and as a result, what we learned in the past is constantly being challenged, refined, and sometimes confounded. Experience is gained by translating training into practice. Increasing experience in risk assessment enables the assessor to better understand the many factors affecting any one tree, or group of trees. But, no matter how much experience the assessor has, every one of us still has to deal with the element of uncertainty.

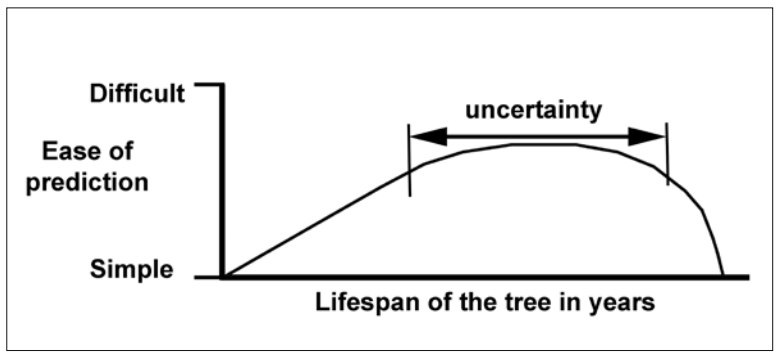


Figure 1: Risk levels extend over a spectrum from very low to very high.

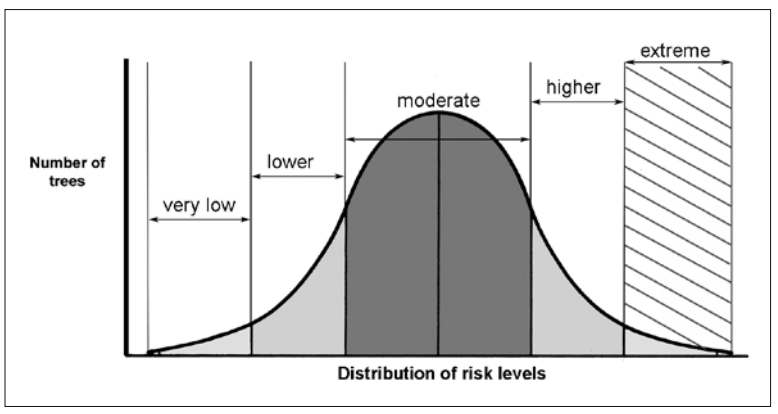


Figure 2: As the tree gets really old and close to the point where it is ready to die, the ease of predicting failure gets easier once again, because the biomechanical features of the tree get easier to see and interpret.

Risk levels extend over a spectrum from very low to very high. We can model that conceptually in a simple chart, as in Figure 1. For this example, the chart follows a standard bell curve of distribution. In practice the shape of the curve varies considerably. Once we gain experience with types of failure by species, climate patterns, site conditions, and other attributes, our knowledge and understanding improves, and to some extent, our discomfort with uncertainty lessens. For the novice, a lack of experience produces large amounts of uncertainty about how to interpret the externally visible symptoms of a tree, simply because they have no other reference point for comparison. The experienced assessor may well examine the same tree and undertake detailed tests, and make interpretations that lead to very different predictions, resulting in a risk level that is lower or higher. Either person will face the challenge of seeing and reading the body language of the tree, and interpreting the biomechanical implications, although the factors of concern to the novice may be quite different from those of concern to the expert.

Risk assessment is further complicated by time. Risk assessment conclusions are based on the information available at the time of the assessment. Because our knowledge of how any one tree will perform in the future is limited, our ability to accurately predict future risk is also limited. As the length of time increases from the point of assessment, so too does the amount of uncertainty inherent in the prediction. Over the lifespan of a tree we would reasonably expect that it should be relatively simple to predict probability of failure when the tree is young and vigorous; we would probably predict that failure is not likely. As the tree reaches middle age, assorted biological and mechanical issues become more likely, but when these will lead to failure is often difficult to know. Of course, as the tree gets really old and close to the point where it is ready to die, the ease of predicting failure gets easier once again, because the biomechanical features of the tree get easier to see and interpret. Figure 2 shows this concept. At all stages of the lifespan we face some uncertainty about our predictions, and it is unlikely that we will always be correct. Predicting risk issues in a short time frame has less uncertainty than those made for several years or even longer time frames (which is why the competent assessor understands the use of well defined limiting clauses in the assessment report). We have no means of knowing how the weather, environmental conditions, site changes, and the tree's response to any of these will occur in future years. That creates huge uncertainty in our predictions, and as a result, the assessment is most valid on the day it was undertaken, and may become increasingly less valid over time, as the situation changes.

Since uncertainty is inevitable, we deal with it best by recognizing its existence and incorporating it into the risk assessment process. By far and away the best approach comes with experience examining trees that have already failed. That knowledge will be greatly enhanced by understanding the basic principles of tree biology and mechanics, the properties and growth patterns of trees throughout their entire lifespan, and by ensuring that all risk assessments incorporate a clear recognition of what we do and do not know. Of course, it is tempting to be so conservative about risk that we always err on the side of caution. But, large numbers of trees have been cut down far too soon, simply because the assessor lacked the confidence to deal with uncertainty. And yes, there are undoubtedly some trees that were retained after a risk assessment that should have been removed, although this is not that common if the risk assessor is competent. Developing expert skills at dealing with uncertainty takes time, but it is not impossible. Recognise it, understand it, and then integrate it into the assessment process and your risk assessment results.

New research and better knowledge is constantly emerging, and as a result, what we learned in the past is constantly being challenged, refined, and sometimes confounded.

Dunster & Associates Environmental Consultants Ltd.

Dr. Julian A. Dunster R.P.F., M.C.I.P., Certified Arborist
ASCA Registered Consulting Arborist # 378

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jadunster@gmail.com Canada (604) 947 0016