Tree Risk Assessment: A Foundation

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LEARNING OBJECTIVES

The arborist will be able to

- Describe how tree risk assessment fits into the larger context of tree risk management
- Define basic terms used in tree risk assessment and explain the difference between "risk" and "hazard"
- Discuss the various types of targets and explain how target mobility and occupancy rates affect their likelihood of being impacted by tree failure
- Describe how targets play a role in both their likelihood of impact and consequences of impact in tree risk assessment
- Discuss the characteristics of a site that should be considered in tree risk assessment and the ways they affect the assessment

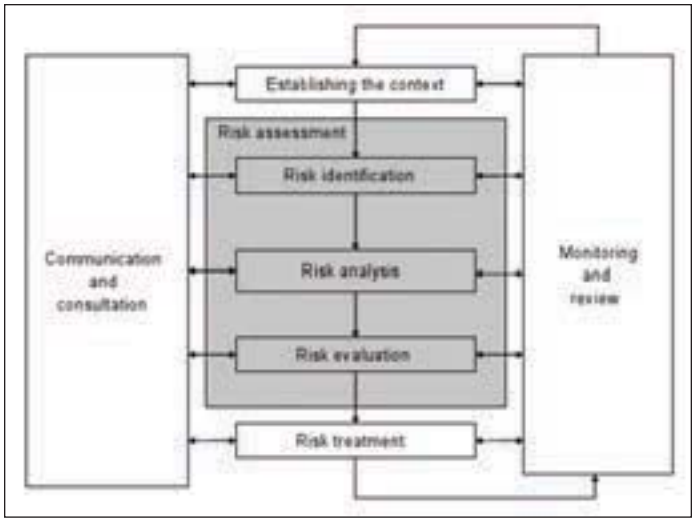
CEUs for this article apply to Certified Arborist, Utility Specialist, Municipal Specialist, Tree/Worker Climber, and the BCMA management category.

Editor's Note: This article is the first of an extensive look at tree risk assessment. Future articles will approach in detail the levels of assessment, risk categorization, mitigation, reporting, and factors that affect tree risk.

Tree failure that causes harm is a relatively rare occurrence, so the risk associated with living among trees is quite low. Nevertheless, it is impossible to maintain trees free of risk; some level of risk must be accepted to experience the benefits that trees provide. The National Tree Safety Group, which is a partnership of organizations in the United Kingdom, has drafted a guidance document that identifies five key principles for tree risk management. This provides a foundation for balancing tree risk and the benefits the trees provide:

- Trees provide a wide variety of benefits to society
- Trees are living organisms and naturally lose branches or fall
- The risk to human safety is extremely low
- Tree owners have a legal duty of care
- Tree owners should take a balanced and proportionate approach to tree safety management

It is helpful to look at tree risk assessment within the larger context of tree risk management. Tree risk management is the application of policies, procedures, and practices used to identify, evaluate, mitigate, monitor, and communicate tree risk. Various people share responsibilities for tree risk management—including the tree owner or manager, the tree risk assessor, and the arborist providing service work.



Contribution of risk assessment to the risk management process.

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Tree risk is the likelihood of a tree failure occurring and affecting a target, and the severity of the associated consequences—personal injury, property damage, or disruption of activities.

Risk Assessment Basics

The benefits trees provide to those living and working in the urban environment increase as the size of the trees increase. As a tree gets older and larger, however, it is also more likely to shed branches or develop decay or other conditions that predisposes the tree to failure. In assessing and managing trees, we should strive to strike a balance between the risk that a tree poses and the benefits that individuals and communities derive from trees.

Before a tree risk assessment takes place, it is important to determine if the possible degree of risk justifies the time and expense to perform tree inspection and assessment. Many trees are located where the consequences of failure are minor or negligible. In urban and developed areas where people, property, and activities could be injured, damaged, or disrupted, the consequences of tree conflict or failure may be significant or severe. Decisions on whether a tree inspection is required or what level of assessment is appropriate should be made with consideration for what is reasonable and proportionate to the specific conditions and situations. These are tree risk management issues.

As previously stated, it is impossible to maintain trees free of risk. Some level of risk must be accepted to experience the benefits that trees provide. Fortunately, tree failure is an infrequent occurrence. Serious damage, injury, or death from tree failure is rare. Tree failures during normal weather conditions are sometimes predictable and preventable. However, any tree, whether it has visible weaknesses or not, will fail if the forces applied exceed the strength of the tree or its parts. For example, hurricane-force winds, heavy snow, or freezing rain can break solid, defect-free trees.

Tree risk assessors often must perform risk assessments with limited information about the structural condition of the tree and the environment that affects it. There is typically a considerable level of uncertainty associated with tree risk assessment due to our limited ability to predict natural processes (e.g., rate of progression of decay, response growth), weather events, traffic and occupancy rates, and potential consequences of tree failure. Tree risk assessors form opinions about what is likely to occur in the future based upon their experience and what is observed. These assessments are then provided to a tree owner or manager to make decisions about tree management. Sources of uncertainly should be understood and communicated to the risk manager/tree owner.

Definitions

There are a number of key definitions required for the understanding of tree risk assessment concepts. A partial list of these definitions follows:

Risk is the combination of the likelihood of an event and severity of the potential consequences.

In the context of trees, risk is the likelihood of a conflict or tree failure occurring and affecting a target, and the severity of the associated consequences—personal injury, property damage, or disruption of activities.

Risk versus Hazard

Arborists and foresters have used the term *hazard assessment* to describe the process of inspecting and evaluating the structural condition of a tree and the harm that could occur if said tree fails. The more accurate and appropriate term *risk assessment* is now standard.

A tree is considered *hazardous* when it has been assessed and found to be likely to fail and cause an unacceptable degree of injury, damage, or disruption—that is, the tree poses a high or extreme risk.

Risk is the combination of the likelihood of an event and the severity of the potential consequences.

A *hazard* is a likely source of harm. In relation to trees, a *hazard* is the tree part or parts identified as a likely source of harm.

Tree risk assessment is the systematic process to identify, analyze, and evaluate tree risk.

Tree risk evaluation is the process of comparing the assessed risk against given risk criteria to determine the significance of the risk.

Risk is evaluated by categorizing or quantifying both the likelihood (probability) of occurrence and the severity of consequences. The magnitude of risk can be categorized or calculated and compared to the client's tolerances to determine if the risk is acceptable.

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