

Community Tree Risk Assessment

Introduction:

Tree risk assessment (TRA) is the systematic process used to identify, analyze, and evaluate tree risk. By identifying tree risk before and after a storm event, mitigation can be conducted to reduce risk while preserving trees that have an acceptable level of risk. This briefing paper will offer recommendations for the use of TRA best practices to identify tree risk in order to mitigate risk and minimize unnecessary tree removal.

Background:

In the past few years, the process of TRA for trees has been standardized by the American National Standards Institute (ANSI) A300 Standard (Part 9:2010) and the International Society of Arboriculture (ISA) Best Management Practice (BMP) for Tree Risk Assessment (2011). The procedures for TRA outlined in the *ANSI A300 Part 9 Standard* and the *ISA Tree Risk Assessment BMP* can be used on any tree, either before or after a storm event to assess tree risk. The key to the use of the procedure by city foresters, FEMA or other organizations is to define who is qualified to conduct tree risk assessments, the level of assessment that should be used, the time frame for assessments, and the threshold at which trees should be recommended for reimbursable mitigation actions such as pruning or removal.

Discussion:

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

The purpose of the ISA TRA BMP is to guide arborists to assess tree risk as accurately and consistently as possible, to evaluate that risk, and understand which treatments can achieve an acceptable level of risk. Tree risk assessments can be conducted at different levels and may employ various methods and tools. Three levels of tree risk assessment are defined and described:

- Level 1: Limited visual – a rapid visual assessment from a specified perspective, looking for serious defects.
- Level 2: Basic- a visual tree assessment requiring walking around the tree and possibly using simple tools to assess the tree and site conditions.
- Level 3: Advanced- a more in depth assessment looking at specific factors affecting tree risk.

A primary goal of tree risk assessment is to provide information about the level of risk posed by a tree over a specific time period. This is accomplished in qualitative tree risk assessment by first determining the categories for likelihood and consequences of tree failure. These factors are determined by:

1. Evaluating the structural conditions that may lead to failure; the potential loads on the tree; and the trees' adaptations to weaknesses—to determine the likelihood of failure.
2. Evaluating the likelihood that a tree or branch could strike people or property or disrupt activities.
3. Assessing the injury, damage or disruption—to estimate the consequences of failure.

A matrix-based, qualitative approach to tree risk assessment is used in the ISA BMP to define the level of risk. The risk category is then compared to the level of risk that is acceptable to the client, controlling authority, or societal standards. If the risk category defined for the tree risk exceeds the level of acceptable risk, mitigation is recommended.

Table 1. The ISA TRA BMP matrix used to estimate the likelihood of a tree failure impacting a target within a specified time frame.

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
<i>Imminent</i>	Unlikely	Somewhat likely	Likely	Very likely
<i>Probable</i>	Unlikely	Unlikely	Somewhat likely	Likely
<i>Possible</i>	Unlikely	Unlikely	Unlikely	Somewhat likely
<i>Improbable</i>	Unlikely	Unlikely	Unlikely	Unlikely

Table 2. The ISA TRA BMP risk rating matrix showing the level of risk as the combination of likelihood of a tree failing and impacting a target, and severity of the associated consequences.

Likelihood of Failure and Impact	Consequences			
	Negligible	Minor	Significant	Severe
<i>Very likely</i>	Low	Moderate	High	Extreme
<i>Likely</i>	Low	Moderate	High	High
<i>Somewhat likely</i>	Low	Low	Moderate	Moderate
<i>Unlikely</i>	Low	Low	Low	Low

The four terms for risk ratings are used to communicate the level of risk and to assist in making recommendations to the owner or manager for mitigation and inspection frequency. The priority for action depends upon the risk rating and risk tolerance of the owner or manager.

A hazard tree (syn. “hazardous tree”) is a tree identified as a likely source of harm. Hazardous trees are those that have been assessed and have been determined to pose an unacceptable risk. A hazard is the tree part(s) identified as a likely source of harm.

The ISA BMP process is the basis for the ISA *Tree Risk Assessment Qualification* (TRAQ). This is a 2.5 day class that presents the information from the BMP and the *TRAQ Manual*. At the end of the class, TRA skills are tested and graded. Those who pass the Qualification receive documentation and their names are listed on-line for verification. This TRA qualification therefore provides training, testing, and verification.

The key to the use of the procedure by city foresters, FEMA or other organizations is to define the threshold at which trees should be recommended for removal. In general, to preserve trees and maintain the urban tree canopy, the threshold should be set to ‘Moderate’ or ‘High’. That is, trees that have a ‘Low’ or ‘Moderate’ risk rating should not be recommended for removal, or removal should not be reimbursed for those trees.

Proposed Actions for Planners:

1. The techniques for tree risk assessment (TRA) established by the ISA Tree Risk Assessment BMP should become the accepted procedure for evaluating tree risk.
2. Individuals conducting TRA should be ISA Tree Risk Assessment Qualified.
3. The level of assessment should be established at Level 1 or Level 2 for risk prior to and after storm events.
4. The time frame for tree risk assessments should be established in plans and agreements. The recommended time frame is 3 years.
5. A threshold for mitigation should be established in plans at either 'Moderate' or 'High'.
6. When risk exceeds the threshold, mitigation should be recommended and conducted. When risk does not exceed the established threshold, the tree should not be recommended for removal or removal should not be reimbursed for those trees.
7. Planners should build relationships with emergency planners to ensure these practices are included in preparedness, response, and recovery plans and agreements.