Symposium on Urban Forest Management & Tree Risk Management

28 April 2018

Tree Risk Management

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Organizers: Hong Kong Institute of Horticultural Science (HKIHS)
Horticulture Exchange Foundation Ltd
Industrial Ecology Research Unit, School of Life Sciences, CUHK

Co-Organizers: Technological and Higher Education Institute of Hong Kong (THEi)

HKIHS
香港園藝專業學會
Hong Kong Institute of Horticultural Science

THEi

Issue

Response to a Tree-Related Incident

"Mother of 3 injured in Central Park tree fall speaking out."
abc7ny.com

Issue

Risk is about uncertainty.

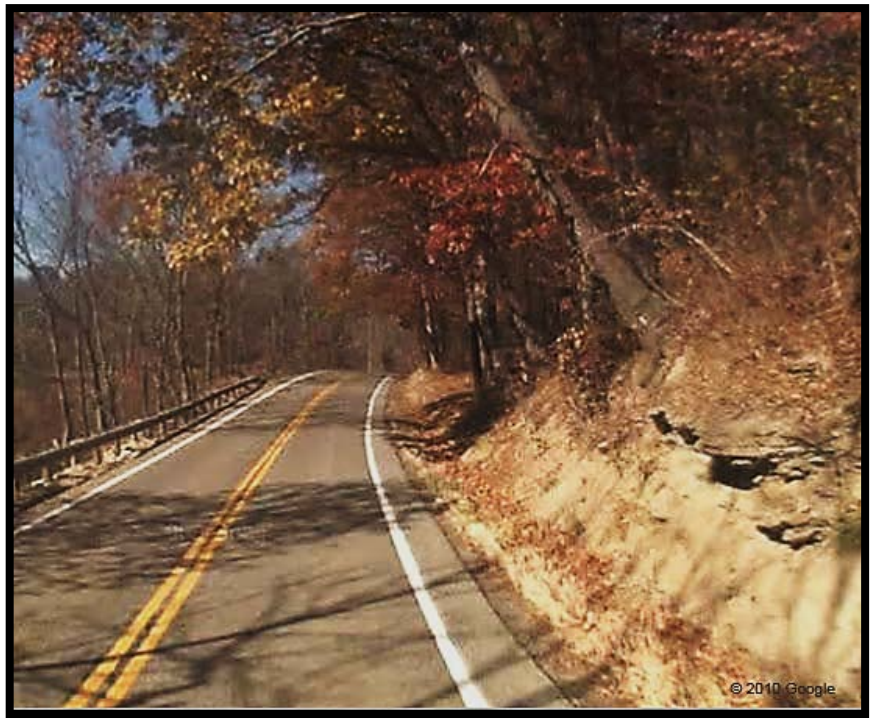
...not absolutes.

Risk Associated with Trees

Depends on the likelihood of <u>two</u> events typically happening at almost concurrent moments:

- The likelihood of a tree part failure (1) within a given time frame (2).
- If the part fails, the likelihood of striking a target (3).

<u>If</u> the part fails and <u>if</u> a target is struck what are the potential consequences (4).



Risk Management

Making choices at the system level in the presence of uncertainty.

Regia Emilia, Italy

Central Park, New York

Hong Kong

Risk Management

Process in which an agency assesses and monitors its risks and makes choices to address those risks.

Risk Management

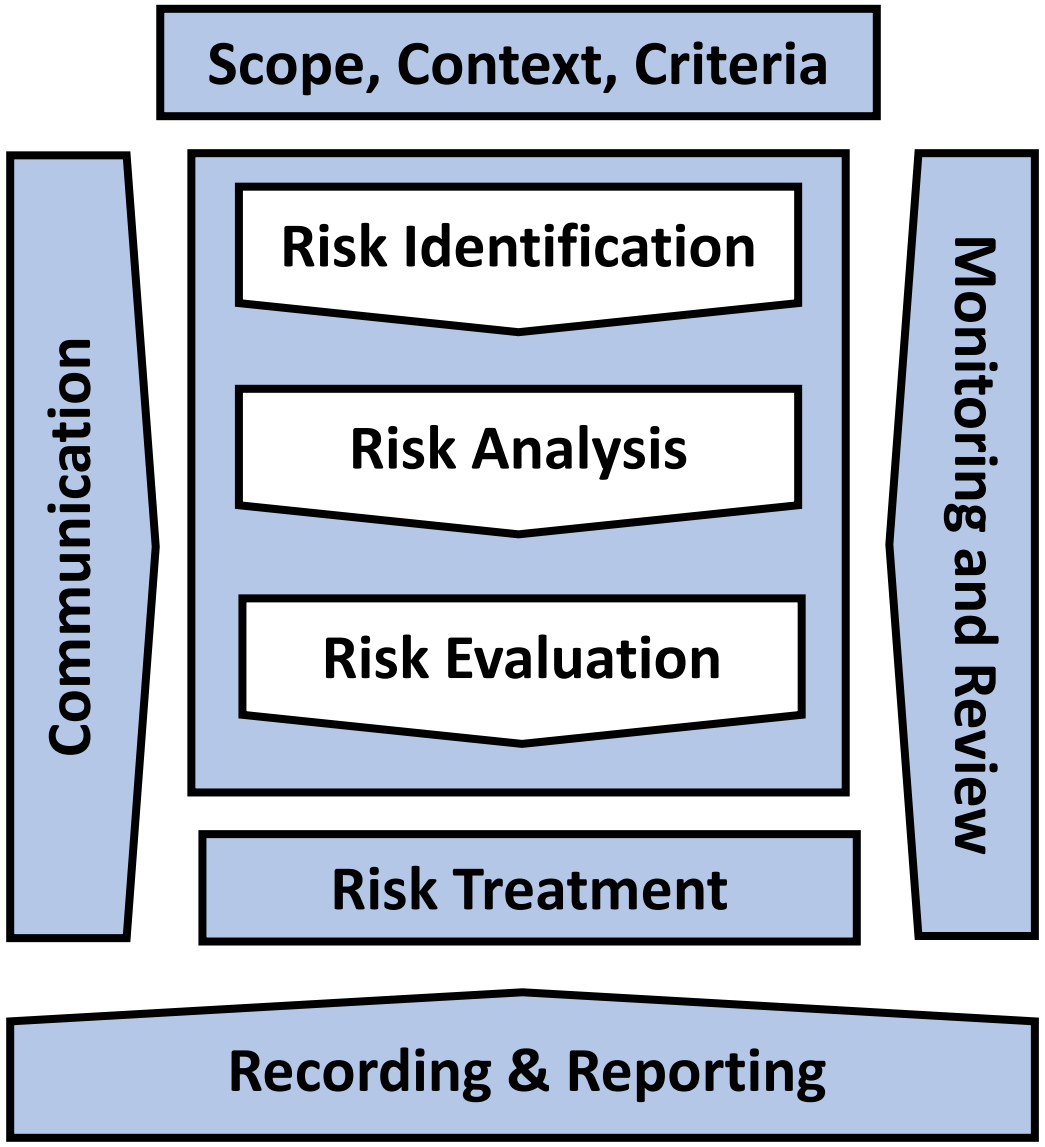
Foundation for Managing Risk

International Organization of Standardization

Primary Documents:

- ISO 31000 (2018) – Risk Management – Guidelines
- ISO 31010 (2018) – Risk Management – Risk Assessment Techniques

Risk Management Process



Tree Risk Assessment

Risk Assessment is the technical process for:

- Evaluating what unexpected things could happen,
- How likely they are to occur, and
- The consequences if they were to occur.

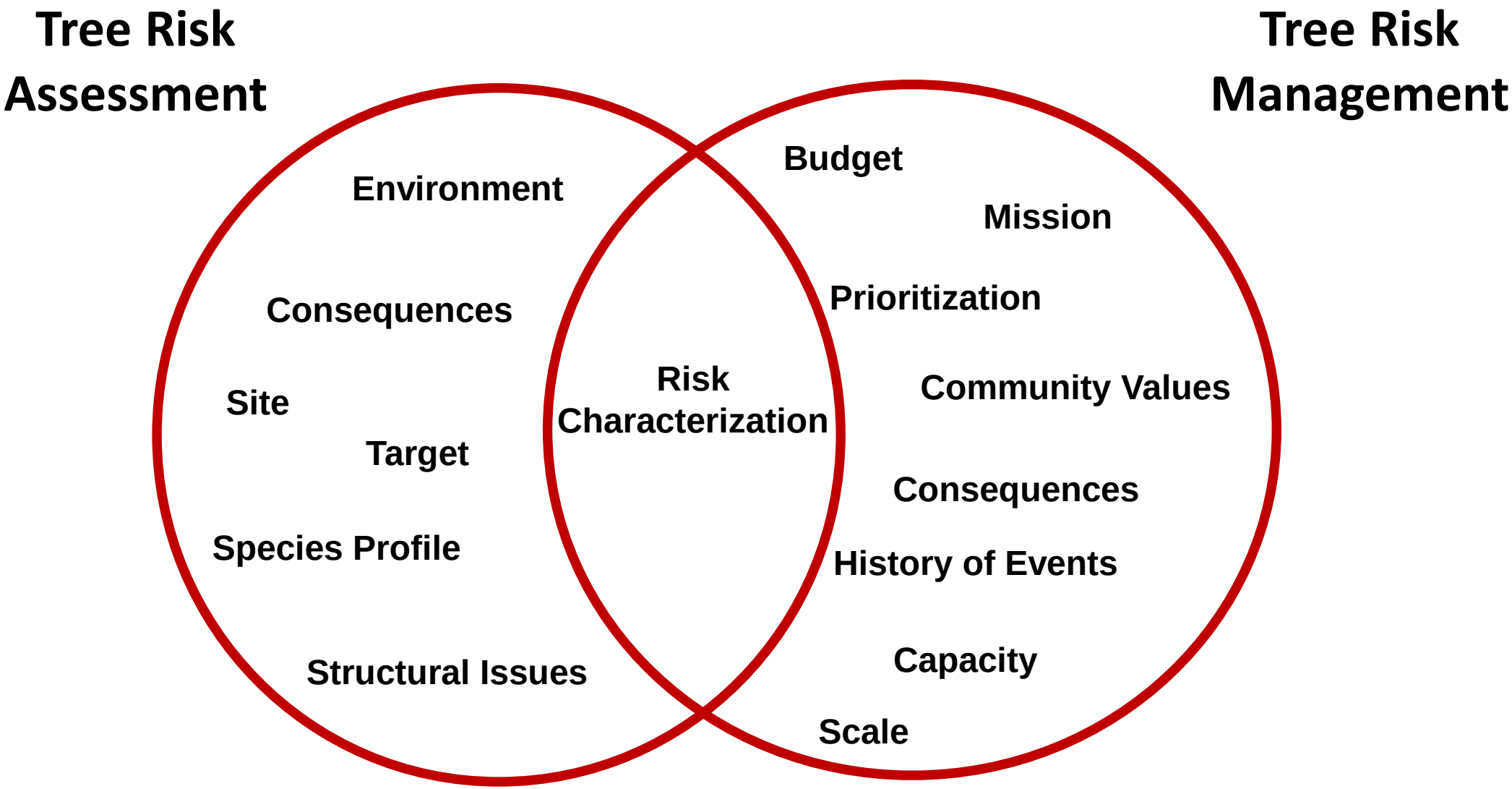
Tree Risk Assessment

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

An overall risk rating for the subject tree.

Mitigation options to address the risks identified.

Confluence of Tree Risk Assessment & Risk Management



Confluence of Tree Risk Assessment & Risk Management

While a person may have the technical skills to conduct a tree assessment, they may not have the experience, education or appropriate understanding of the system to provide risk management guidance.

Tree Risk Assessments at a System Level

Municipalities manage populations of trees.

- They have duty to inspect and manage trees in a reasonable manner.

- It's unreasonable to expect that every tree will can be managed to eliminate risk.

Confluence of Tree Risk Management & Litigation

In tree-related litigation, the discussion of whether a tree is a hazard is often defined in overly-simplistic terms.

Confluence of Tree Risk Management & Litigation

1. A tree is viewed as a hazard in absolute terms. In other words, the subject tree was a hazard or not a hazard.

The risk associated with a tree is complex. Every single tree part has some potential to fail.

Confluence of Tree Risk Management & Litigation

2. The context of the non-subject trees are minimized.

The subject tree is not managed in a vacuum. Choices are made as part of a larger system.

Confluence of Tree Risk Management & Litigation

3. If the tree part was removed prior to it failing, the tree would have been safe.

Risk is never completely eliminated when trees are present.

This also assumes that the structural issue associated with the tree part could have been discerned prior to the failure.

Confluence of Tree Risk Management & Litigation

4. Post-failure knowledge is used to define a pre-failure understanding of the tree.

We have a bias toward assigning a higher risk to a tree after a failure then we would have assigned prior to the failure.

Confluence of Tree Risk Management & Litigation

5. A high inspection and maintenance rigor is assigned to the subject tree.

The resources required to achieve this level of rigor is, at times, unreasonable and impractical.

Logical Fallacies

Two issues highlight the flaws in logical fallacy statements:

1. There is a linear correlation that is typically untrue. (if, then statements)

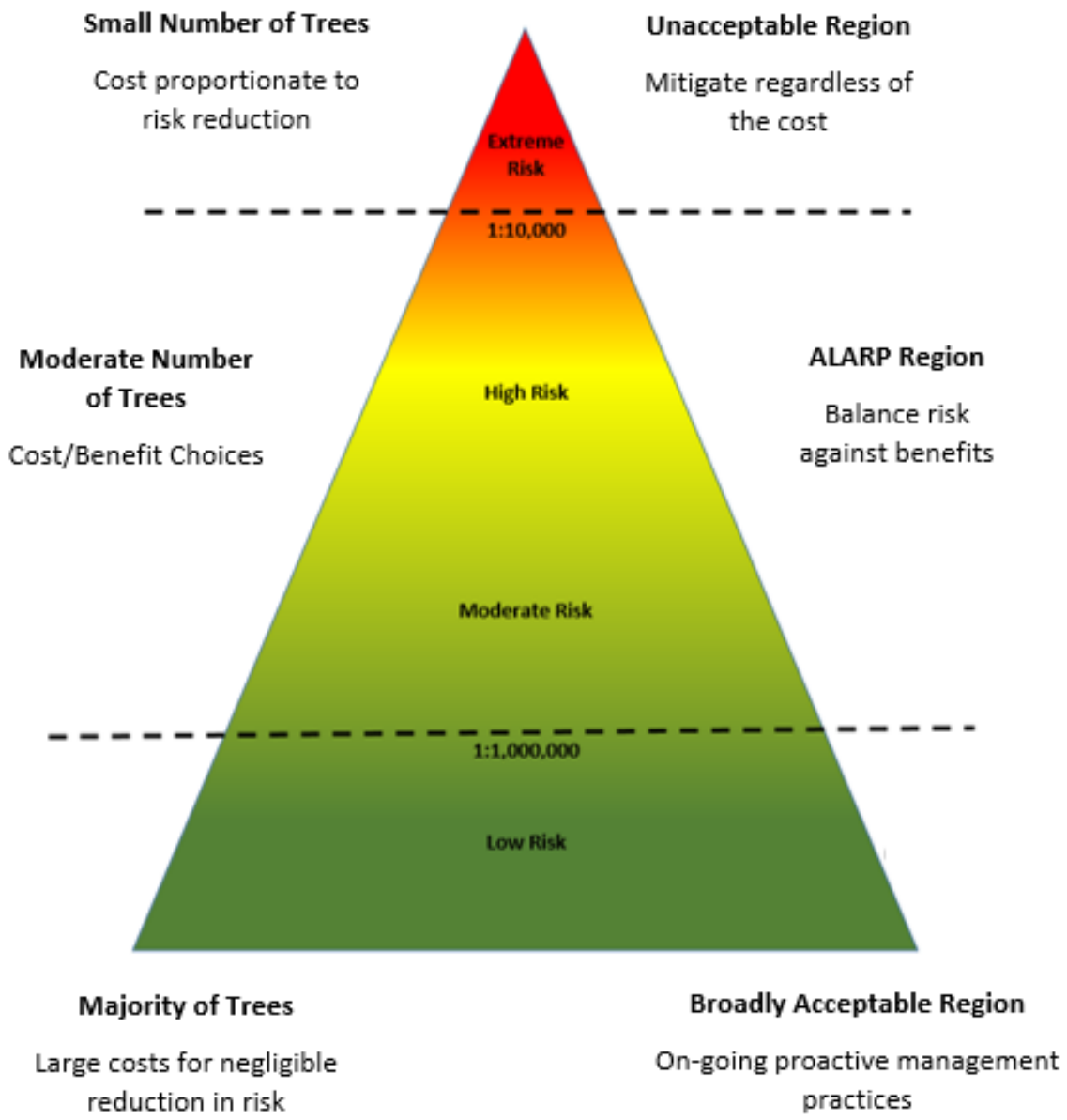
If the tree branch had a defect…

…then you should have done something.

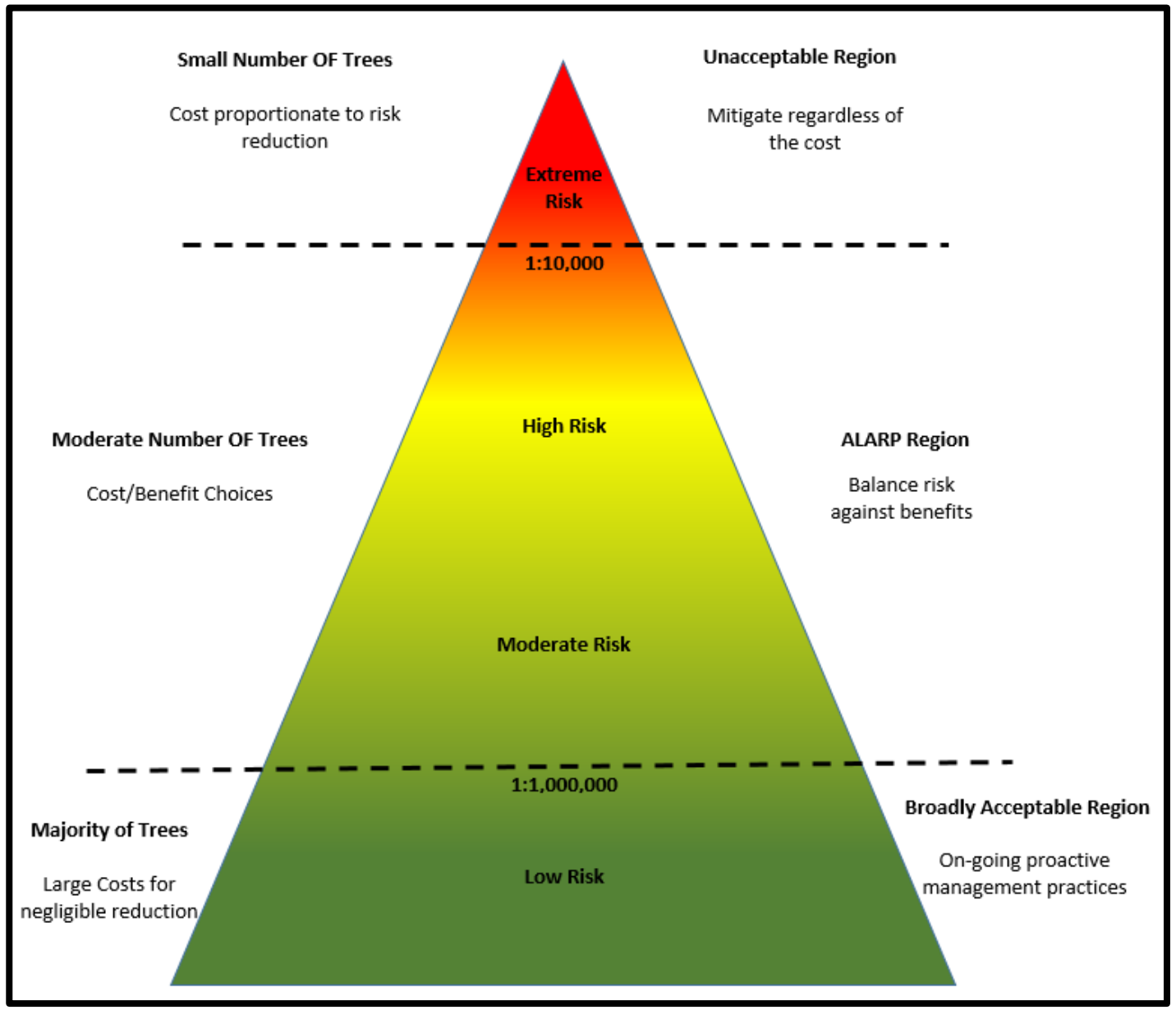
Logical Fallacies

2. Lack of system context develops a narrow discussion that focuses on risk assessment and minimizes the relevance and role that risk management plays.

As Low As Reasonably Practical

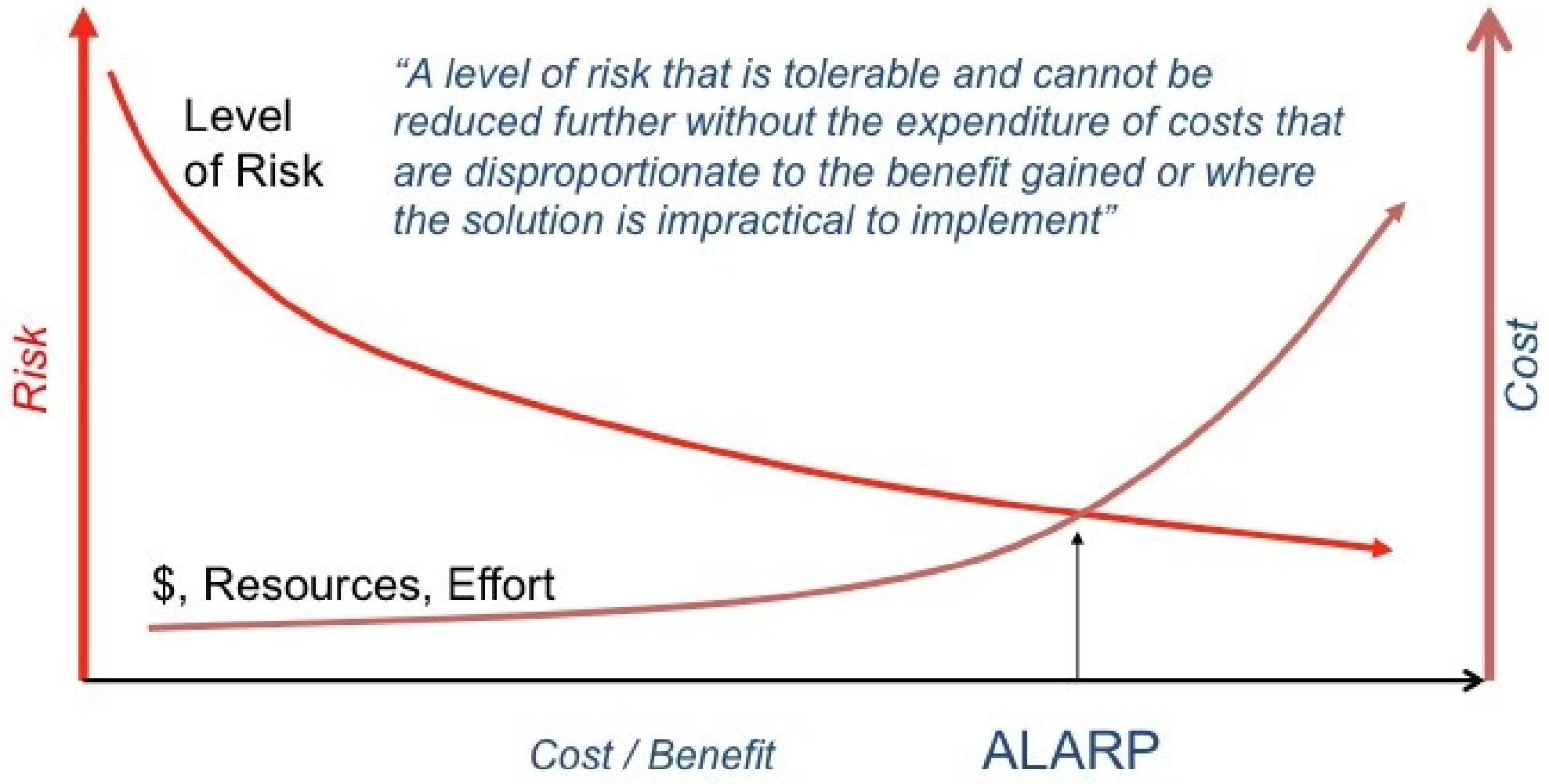


As Low As Reasonably Practical



- Risk can only be reduced to a certain level.
- Additional outlay of resources may be grossly disproportionate to the actual risk.
- As risk is lowered we must make conscious choices between the cost to manage the risk and the benefits derived.
- Our choices are driven, in part, by tolerance levels.
- As risk decreases, uncertainty increases

As Low As Reasonably Practical



www.jakeman.com.us

As Low As Reasonably Practical

As Low As Reasonably Practical

As Low As Reasonably Practical

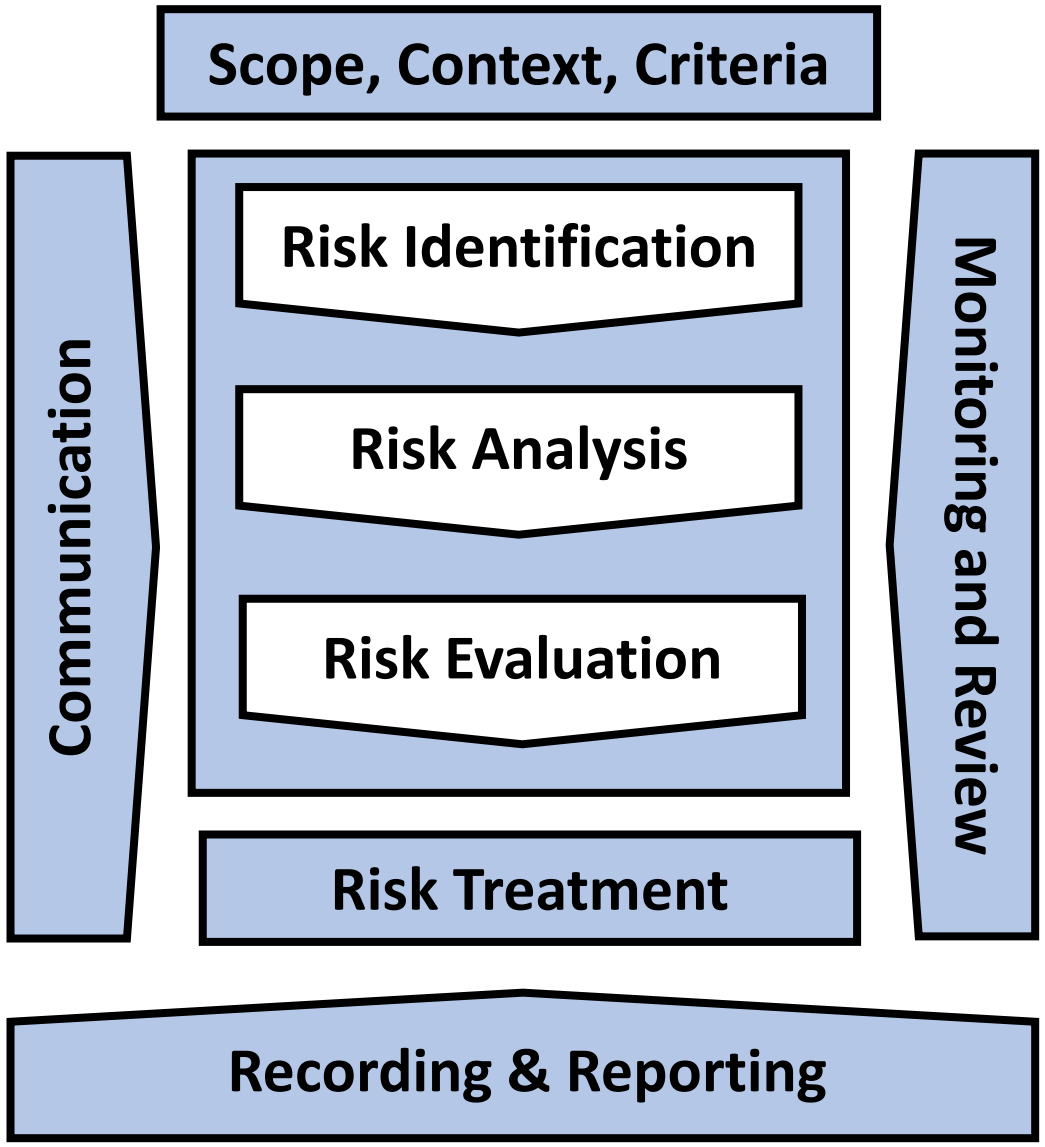
- Cost to Manage
- Risk of Physical Harm
- Loss of Species-Specific Aesthetics

Risk Reduction Goals

The risk analysis process should identify a number of system-level issues that may need to be addressed.

These issues will typically fall into one of four general categories:

- Tree Resource
- Policies
- Operations
- Training



Risk Reduction Goals

Tree Resource

- Reduce the number of poor or worse conditioned trees.
- Reduce poor-quality species.
- Increase high-quality species.
- Reduce high-risk defects.

Risk Reduction Goals

Policies

- Develop a policy on co-owned trees.
- Implement a tree inventory.
- Develop an Arboricultural Standards Manual (ASM).
- Develop a risk-zone prioritization map.
- Develop an accident/claims history log.

Risk Reduction Goals

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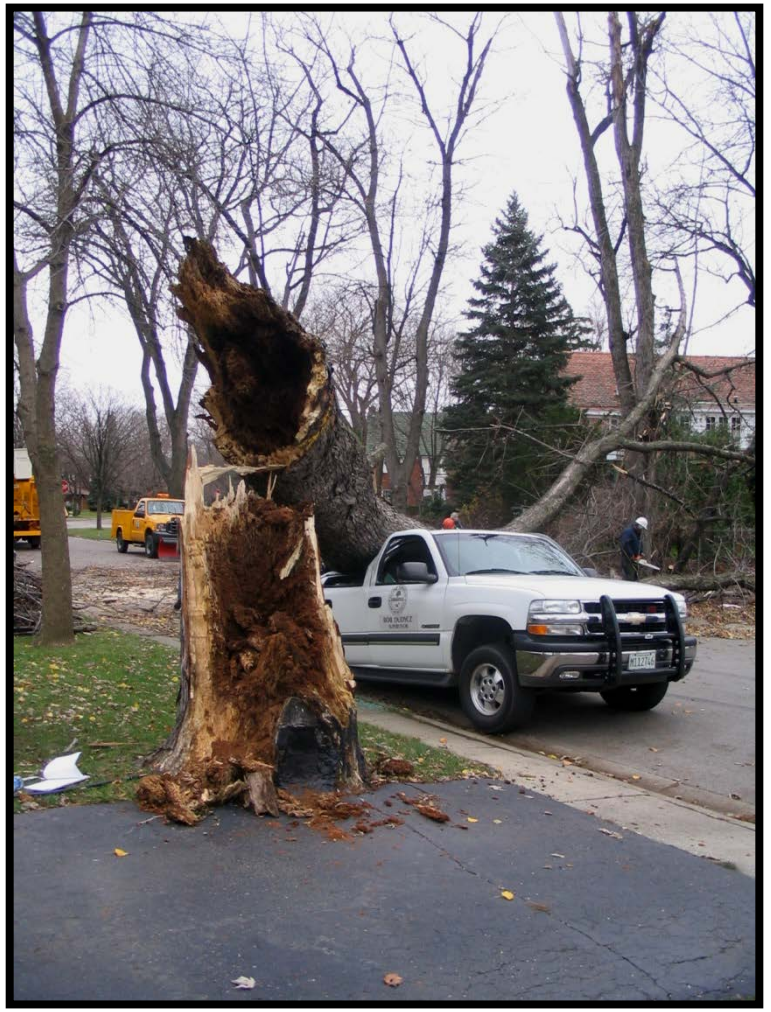
Risk Reduction Goals

Operations

- Implement a cyclic pruning program.
- Implement a mitigation response matrix.
- Implement a inspection cycle.



Risk Reduction Goals

Training

- Increase staff arboricultural skills training.
- Increase staff assessment capacity.
- Increase staff rigging skills.
- Obtain ISA certified arborist certification for select staff.
- Obtain ISA tree risk assessment qualification (TRAQ) for select staff.

Terminology

Original Definition

High-Risk Trees: *High-Risk Trees are trees that have a potential to fail and strike a target.*

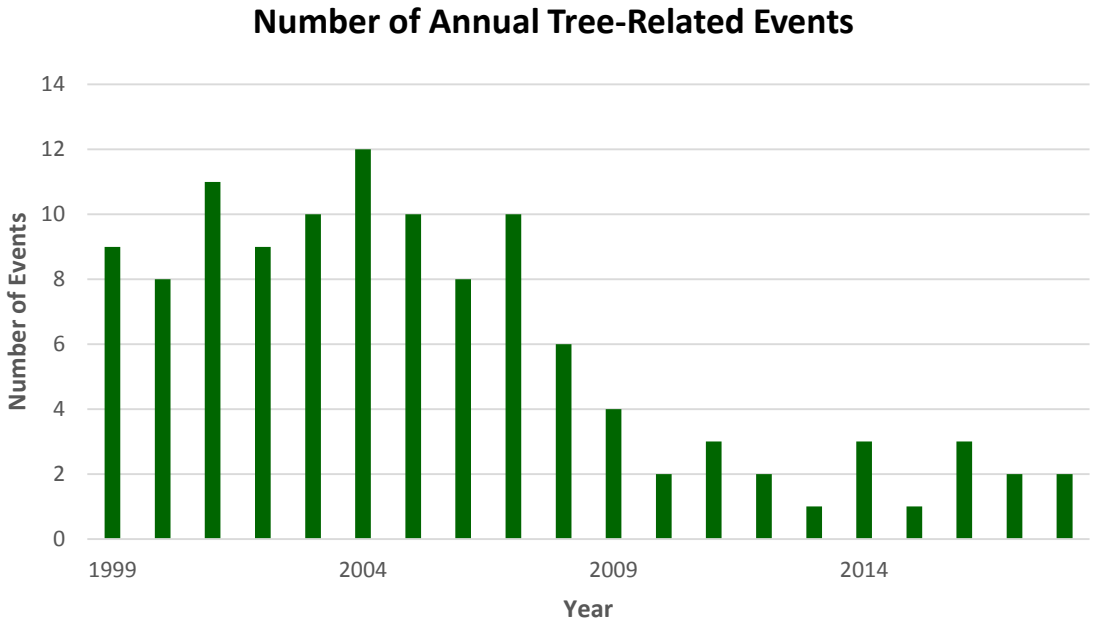
Refined Definition

High-Risk Trees: *High-Risk Trees are trees (or tree parts) that have a high potential for failing, a high potential to strike a foreseeable target resulting in significant consequences. The determination of whether a City-owned tree is high-risk or not can only be made by qualified staff or their designated agent.*

Metrics

Analyze your program's progression:

1. How has training improved?
2. How has the tree population improved?
3. Track the number of tree-related events.
4. Has the number of claims and/or payments decreased?



Tangible and Quantifiable

Metrics – Damage Claims Analysis

Benefits from this type of analysis include:

1. The historical record provides insights into the current level of risk exposure.
2. It provides guidance on potential areas of improvement.
3. Provides direction on modifying the response to specific scenarios.
4. The review process demonstrates that the agency is proactively addressing the issue.

Summary

I. The over-arching goal of an urban forestry program is to promote a healthy, expanding and safe urban canopy.

II. Risk is about managing uncertainty over time.

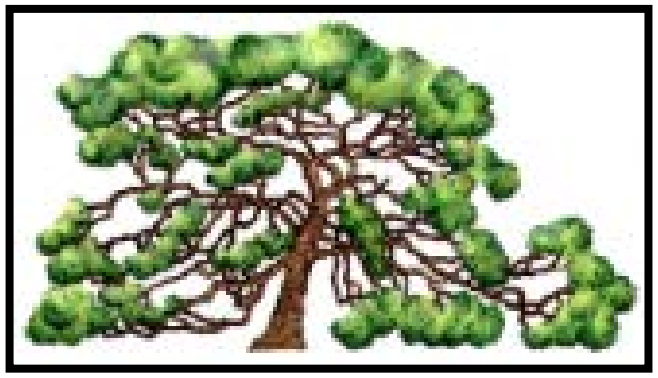
III. Many observations in litigation are logical fallacies that present tree issues in a linear fashion that misrepresent risk concepts and context.

IV. As Low as Reasonably Practical contends that zero risk is not possible and the expenditure of further resources may not quantifiably reduce risk.

V. Must analyze your risk exposure in order to manage it.

VI. Evaluate change over time to provide tangible outcomes.

VII. Critically review policies on a regular basis.



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