



Tree Risk Assessment and Risk Management

Chapter 12 of the ISA's Study Guide based on the 2010 edition

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Key Terms

- Risk Management
- Risk Assessment
- Failure Potential
- Load
- Target

Introduction

- Risk Assessment – is a process by which whole trees and their parts are systematically evaluated for their potential to fail and do damage and or injury.
- Risk Management – is the active application of information found in the assessment to limit the liability associated with the risk.

Risk Assessment Basics

- Failure Potential – is the likelihood that a tree or part of a tree will no longer function as a living tree within a given amount of time. Keep in mind that all trees die and all trees accumulate deadwood. Failure potential is a dynamic variable over time.
- Load – Trees and their parts both living and dead fail when forces acting on them exceed their ability to withstand those forces. These forces are called Loads

Risk Assessment Basics

- Targets – are people and things perceived to have value by the assessing arborist and the tree steward and or the general public. To be a target the item must be within the area that could be impacted by the failure of the tree or its parts. Risk is developed by a combination of failure potential, a target, and the perception of these by the reasonable property owner or designated manager.

Tree Inspection

Key Terms

- Structural Defects
- Visual Tree Assessment (VTA)
- Reaction Wood
- Taper
- Codominant Stem
- Included Bark

Tree Inspection

Key Terms

- Structural Defects – are those attributes of the tree that likely will not continue to bare exceptional loads. Keep in mind that tree structure and tree health are typically mutually exclusive. Defects can come in all sorts of ways both obvious and elusive.

Tree Inspection

Key Terms

Visual Tree Assessment (VTA) – a systematic and consistent methodology of tree inspection.

Look for gaps in the canopies, leans, soil disturbance, open wounds, old pruning damage, tight branching habit, prior signs of failures.

Tree Inspection

Key Terms

Reaction Wood – As new cells develop their size is determined by the physical stresses or loads under which they grow. In a tree perpendicular to the horizon, and cells growing on the trunk, the load of the canopy is evenly distributed around the trunk. If the trunk is leaning then the load at any given point on any cell of the trunk will be different from cell to cell.

Tree Inspection

Key Terms

Angiosperms and Gymnosperms differ in how they produce reaction wood. Angiosperms seem to produce more reaction under tension forces while Gymnosperms seem to produce more reaction wood under compressive forces.

Tree Inspection

Key Terms

Taper – a change in diameter of the trunk or branch from its base to its extremities. The greater the taper the more stable the tree or branch.

Tree Inspection

Key Terms

Codominant Stem – when a tree has two or more trunks of relatively the same diameter.

Included Bark – when stems, branches, or leaders grow at very acute angles such that their diameter expansion traps bark at the tangent point between them



Tree Decay

Key Terms

Conks or Brackets (same thing) are types of fruiting bodies. Conks grow on the woody part of the tree and are responsible for producing spores. Conks can also persist for many years. Mushrooms are another type of fruiting body but they only last from a few hours to several weeks.

Tree Decay

Key Terms

White Rot – a group of fungi that attack primarily “Lignin” or the part of wood that lends itself to compressive strength.

Tree Decay

Key Terms

Brown Rot – is most common on conifers. Brown rot feeds on the whitish colored cellulose leaving the brownish colored lignin.

Tree Decay

Key Terms

Soft Rot – is primarily a cellulose degrader. Most commonly found on dead organic matter, however, there are a few that attack living trees.

Tree Decay

Key Terms

Basal rot, Root rot, Heartwood rot, and Sapwood rot – are simply descriptors of where a rot is found.

Indicators of Decay



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Indicators Decay

Indicators can be broken down into two types. Positive indicators are things like visible fruiting bodies.

Potential indicators are those things that cause may indicate the presence of decay such as swollen areas, cracks, seams, and topping cuts.

Further Investigation

Key Terms

Root Collar Excavations – the removal of mulch, soil, and other debris to allow for an extensive examination of the root collar.

Further Investigation

Key Terms

Air Excavation Devise – a tool that delivers high velocity air and is used to remove soil from the root collar and from around roots. These tools are tree friendly tools.

Further Investigation

Key Terms

Resonance testing – also known as “sounding” is the use of a rubber mallet to hit a branch or trunk to elicit an echo as confirmation of a hollow.

Cavities – these are hollows that are hidden or are open to the surface.

Further Investigation

Key Terms

Increment Borer – an invasive devise that can remove a core sample from a tree for inspection. Use only with caution.

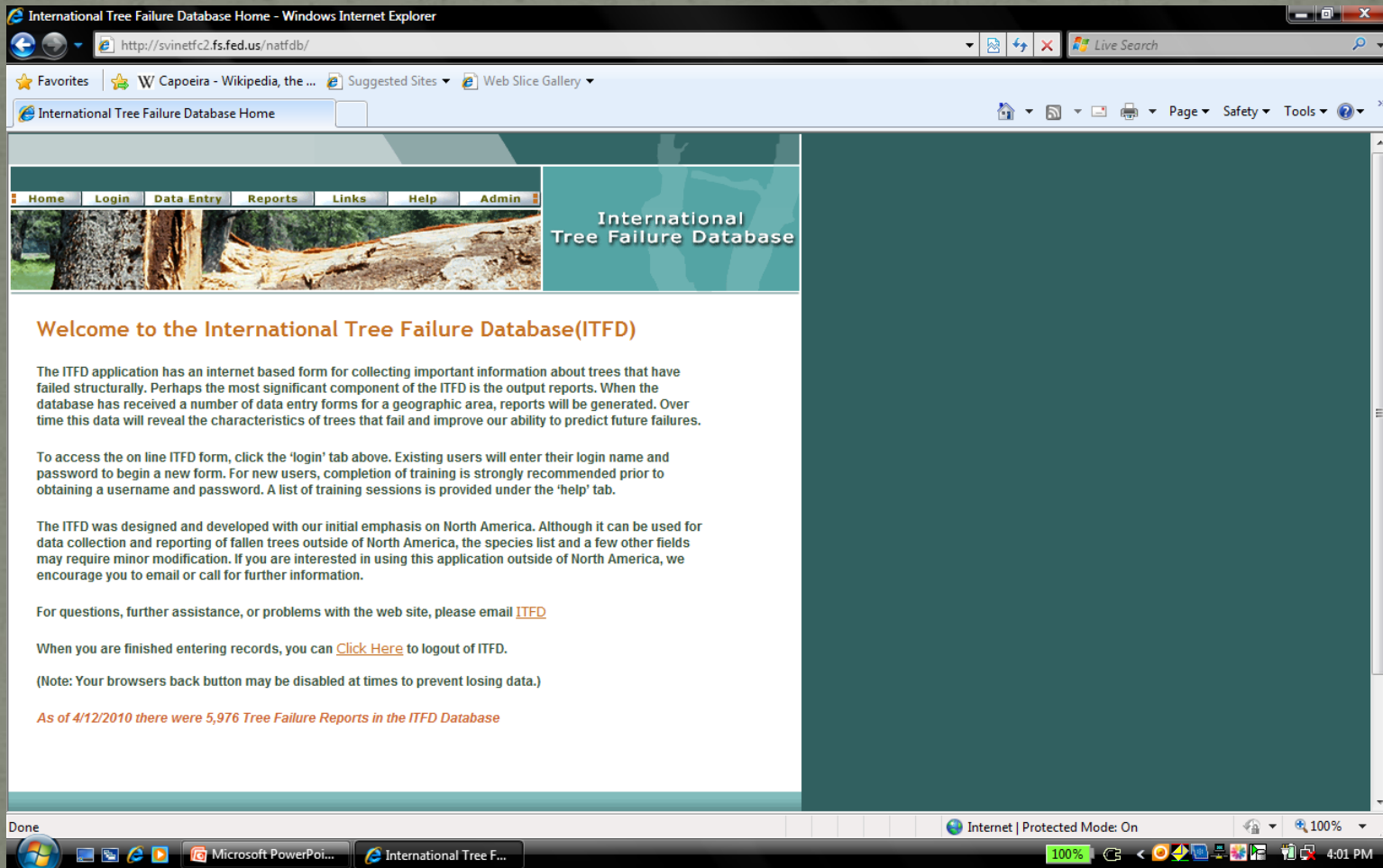
Decay detection devices – apparatus that can aide in the quantification and qualification of decay.

Further Investigation

Key Terms

Tomogram – this is an image that is created by the use of sound waves. Multiple transmitters and receivers read the rate of return and produce a three dimensional image. Wood density changes as it decays and therefore shows up differently in the tomogram.

The International Tree Failure Database



The screenshot shows a web browser window titled "International Tree Failure Database Home - Windows Internet Explorer". The address bar displays the URL "http://svinetfc2.fs.fed.us/natfdb/". The browser's Favorites bar shows "W Capoeira - Wikipedia, the...", "Suggested Sites", and "Web Slice Gallery". The page content includes a navigation menu with links for Home, Login, Data Entry, Reports, Links, Help, and Admin. A banner image shows a tree trunk with a large section missing, with the text "International Tree Failure Database" overlaid. The main content area features a welcome message and several paragraphs of text.

Home | **Login** | **Data Entry** | **Reports** | **Links** | **Help** | **Admin**

International Tree Failure Database

Welcome to the International Tree Failure Database(ITFD)

The ITFD application has an internet based form for collecting important information about trees that have failed structurally. Perhaps the most significant component of the ITFD is the output reports. When the database has received a number of data entry forms for a geographic area, reports will be generated. Over time this data will reveal the characteristics of trees that fail and improve our ability to predict future failures.

To access the on line ITFD form, click the 'login' tab above. Existing users will enter their login name and password to begin a new form. For new users, completion of training is strongly recommended prior to obtaining a username and password. A list of training sessions is provided under the 'help' tab.

The ITFD was designed and developed with our initial emphasis on North America. Although it can be used for data collection and reporting of fallen trees outside of North America, the species list and a few other fields may require minor modification. If you are interested in using this application outside of North America, we encourage you to email or call for further information.

For questions, further assistance, or problems with the web site, please email ITFD

When you are finished entering records, you can [Click Here](#) to logout of ITFD.

(Note: Your browsers back button may be disabled at times to prevent losing data.)

As of 4/12/2010 there were 5,976 Tree Failure Reports in the ITFD Database

Done

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Mitigation

Key Term

Mitigation – is the action required to reduce the risk associated with a tree or the tree's parts.

Pruning to remove deadwood is the most common form of mitigation. The only permanent form of mitigation is tree removal. Other actions are thought to reduce risk, such as cable and brace systems.

Liability and Negligence

Key Terms

Duty of Care - is a legal obligation imposed on an individual requiring that they adhere to a standard of reasonable care while performing any acts that could foreseeably harm others.

When an arborist is on a property it is expected that he or she exercises due diligence on all trees with targets.

Liability and Negligence

Key Terms

Liability – Legal responsibility

Negligence – Failure to exercise due care

Standard of Care – the degree of care a reasonable person should exercise in similar circumstances

Liability and Negligence

Key Terms

Causation in Fact – in court this means that damage, injury, or death can be traced back to the defendant's actions or lack of action.

Proximate Cause – means that the damage, injury, or death was foreseeable.

2003 Tour des Trees

