

## OVERVIEW

### What does it do?

- Detects and provides quantified information on internal decay in tree trunks and structural branches.

### Why use Radar equipment for detecting decay in trees?

- It's non-invasive - avoids the need for drilling holes to assess decay; does not cause any surface damage and has minimal effect on any habitats.

### How accurate is it?

- Standard Ground-Penetrating Radar (GPR) equipment combined with bespoke software offers a high degree of accuracy for detecting internal decay in trees.
- The powerful software analyses and plots the scan data and provides an invaluable tool for the arboricultural/landscape management industry.

### ***Tree Penetrating Radar: how does it work?***

Ground-Penetrating Radar (GPR) has been in use for over 30 years. A non-invasive technology, it is used to locate objects underground including engineering and environmental targets i.e. tree roots; without the need for excavation. Standard GPR instrumentation can be used to detect decay in standing trees.

When Radar pulses encounter a boundary between objects with different properties the electromagnetic waves will reflect, refract, and/or diffract from the boundary in a predictable manner.

Decayed and sound wood in trees have different properties and the electromagnetic waves will reflect, refract, and/or diffract accordingly. These electromagnetic differences are analysed by bespoke software.

Use of standard GPR instrumentation and bespoke software for tree decay mapping is an innovative and recent application and provides reliable data printouts of depth and location of internal tree decay.

**The quantifiable results can be used by a competent arboriculturalist to assess the risk of a tree whose health and structural integrity may have been compromised by decay and loss of solid wood.**

Use of Tree Penetrating Radar for decay detection



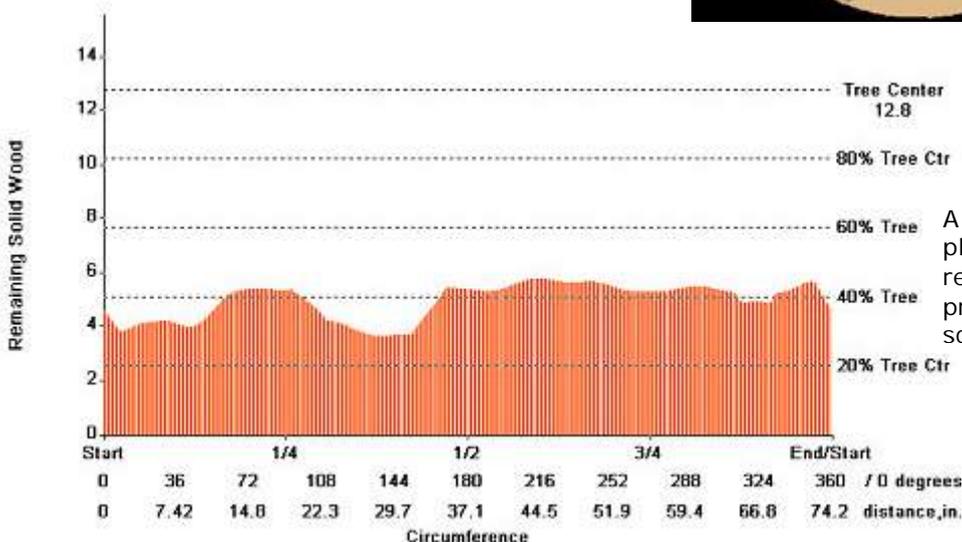
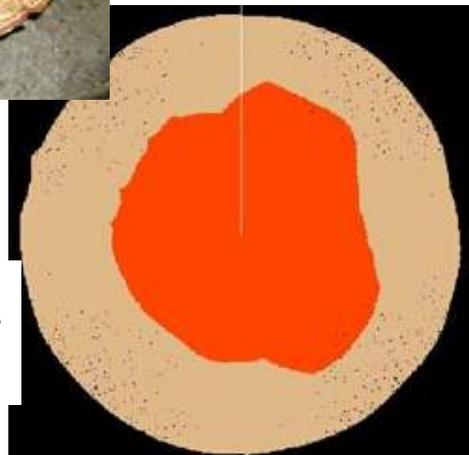
Radar Antennae being used to scan the internal section of trees



Cross section of tree showing extent of decay



Cross-section image generated by the software that represents the internal structure of tree.



A plot, showing a 360-degree plot of the thickness of the remaining solid wood is printed for each elevation scanned.

## Summary

Tree Penetrating Radar provides a full non-invasive investigation facility for decay in trees.

- It acts as a “virtual drill” and is able to image internal decay with a high degree of accuracy.
- The avoidance of invasive drilling circumvents unnecessary damage to a tree.
- Has a minimal effect on any habitats within decayed zones of trees and therefore will not harm or disturb wildlife .
- If present, occupying species can be located within decayed zones without disturbance.

## Outputs

With *TreeRadar*, the site operator can quickly create and record each scan; after the data has been recorded, the post-processing data-analysis software, *TreeWin*, reads the radar-gram.

For each elevation scanned, a cross-section image is created that represents the internal trunk structure. Additionally, a plot, showing a 360-degree section of the thickness of the remaining solid wood is also printed.

A full graphical report can be provided that shows:

- Cross-sectional image at each elevation scanned
- Plot of remaining solid wood at each elevation scanned
- Comments from a competent arboriculturalist regarding interpretation of the results.

**The combination of electromagnetic radar technology and analytical software represents a powerful tool for landscape consultants and arboriculturalists.**