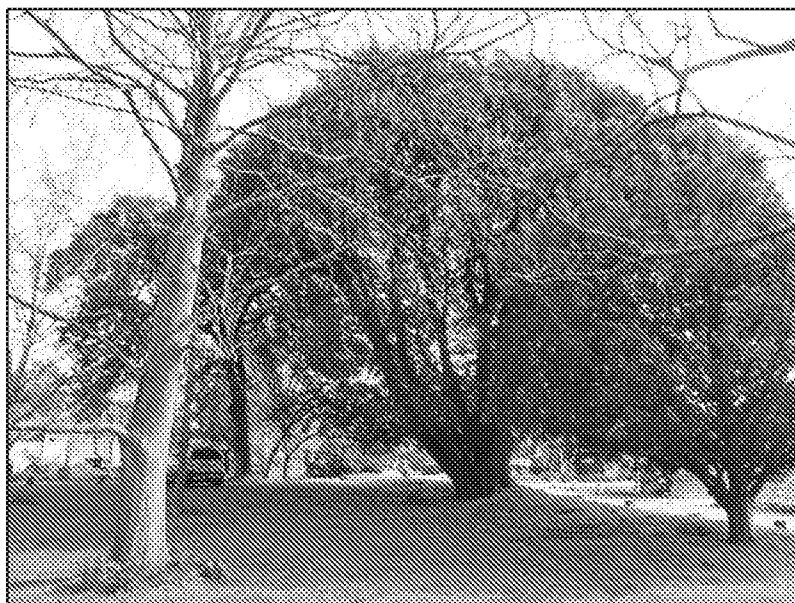


Harraway Trees

Tree Management and Training

Tree Inspection Report



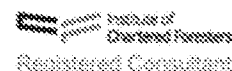
Little Paddocks Estate, Ferring

April 2021

Harraway Trees

Tree Management and Training

John Harraway F.Arbor.A, MICFor, DipArb (RFS)
33 Freshbrook Road, Lancing, BN15 8DF



TREE INSPECTION REPORT

Client: Little Paddocks Freeholders

Location: Little Paddocks, Ferringham Lane, Ferring, West Sussex

Date of inspection: 1 April 2021

Inspector: J. Harraway F Arbor A, MICFor, Dip Arb (RFS)

Our reference: TIR/0421/1

Tree species: Holm oak – *Quercus robur*

Instructions received:

I am instructed by Karl Washer on behalf of the Freeholders at Little Paddocks to carry out a decay evaluation on the lower stem of a mature tree within the grounds of Little Paddocks and report on its structural condition.

General description:

The tree is some 17 metres in height and located within a communal garden area, containing a number of other mature trees and a large pond. The crown is supported by six ascending limbs arising from a short, stout lower stem. The irregular shape of the stem base suggests that the tree may have arisen from several individual stems planted in close proximity and now combined within a single stem.

The lower stem contains a number of old, deteriorating wounds, some containing obvious hollowing. A single fungal fructification was also evident at ground level on the west side of the stem. The crown has been hard-pruned in the past but tree's general level of vigour appeared satisfactory at the time of inspection, based on the density of foliage in the crown, although some dead suppressed limbs were noted in the central upper canopy.

This assessment has been prompted following a recent condition report by another arboriculturist, Ian Brewster of Bourne Trees, dated December 2020, and the results and recommendations considered in conjunction with that document.

Method of inspection:

Following initial visual appraisal, the lower stem was further assessed using a Picus sonic tomography unit, to ascertain the possible presence and extent of internal decay.

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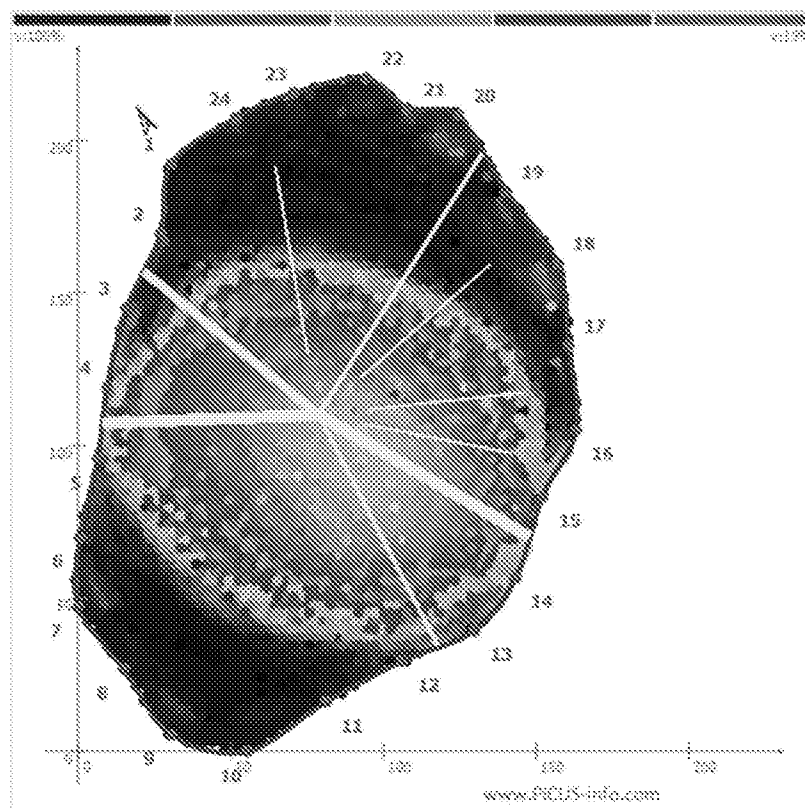
A Treeatron electrical resistance tomograph was also used at the same level to provide additional information. Finally a Resi decay detecting microdrill was deployed in five selected positions around the base. Brief details of the operating systems of each of these instruments are contained in the text of the report.

Results of inspection:

The Picus sonic tomography unit was used at a height of 40cm above ground level, the lowest practicable height in this instance, with a total of 24 measuring points (small nails inserted through the bark into contact with the stem below).

The Picus used the relative velocity of sound waves induced at each measuring point to compose a colour-shift image of the stem. Dark brown areas indicate high relative velocities and hence sound wood; decay and/or hollowing results in areas of lower apparent velocity, shown as maroon/blue on the image, and the increased likelihood of decay.

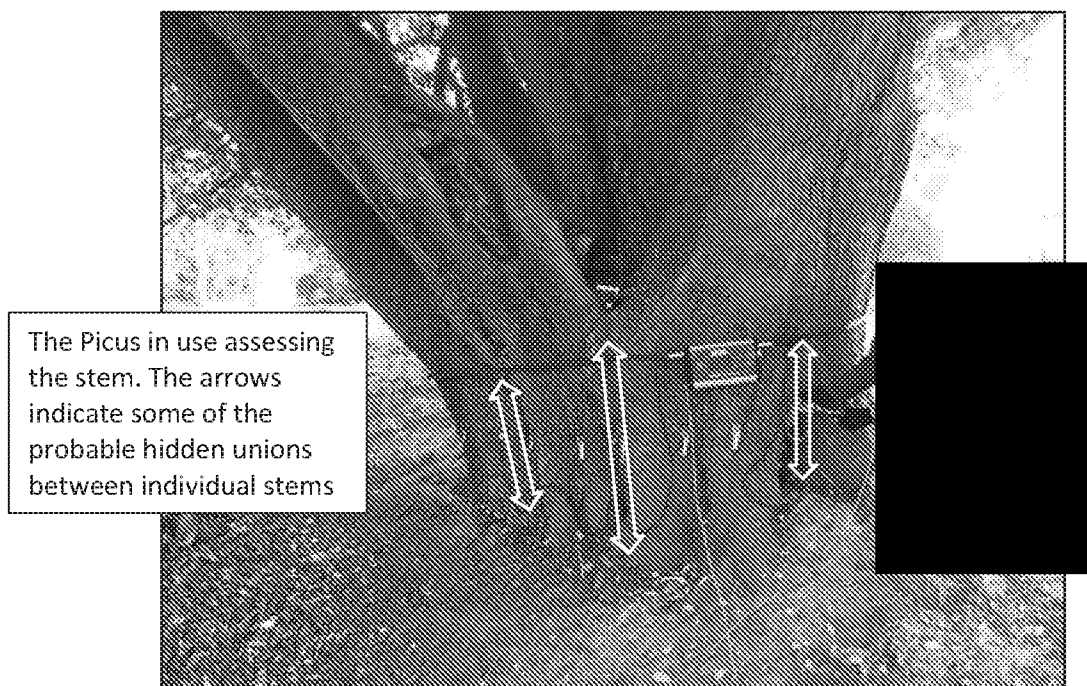
The completed tomogram is shown below; measuring point number one (MP 1) was placed on the north side of the stem, for reference:



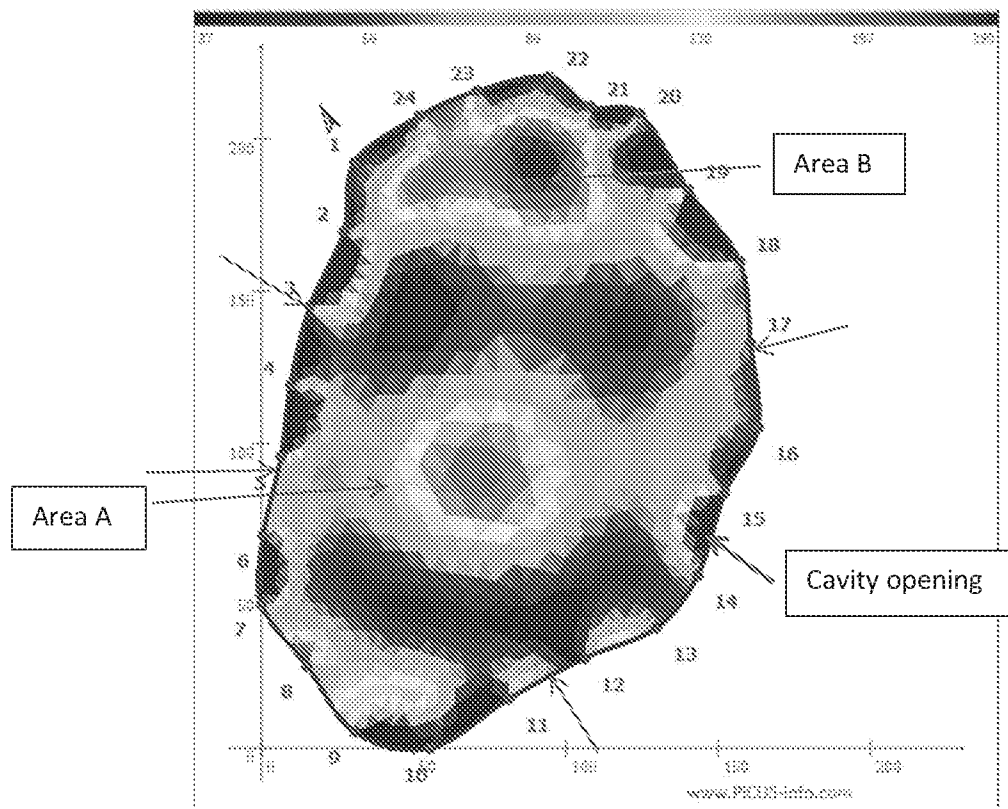
The image indicates a large central area of low sonic velocity, coloured maroon/blue, suggesting the presence of significant deterioration within the stem. However the analysis software has overlaid broad yellow lines on the image, which indicate the presence of very distinct differences in sonic profile between adjacent measuring points. This can occur when radial cracks or other sonic barriers are present in the stem that can have the effect of exaggerating the extent of apparent decay and/or the actual shape of the decayed area.

Document reference: TIR/0421/1

In this instance it is likely that bark layers compressed within the stem between the original component stems making up the base are acting as partial sonic barriers (see photo below). In view of possible inaccuracy in the result a second instrument, the Treetricon was used via the same measuring points.



The result with the Treetricon is shown below:



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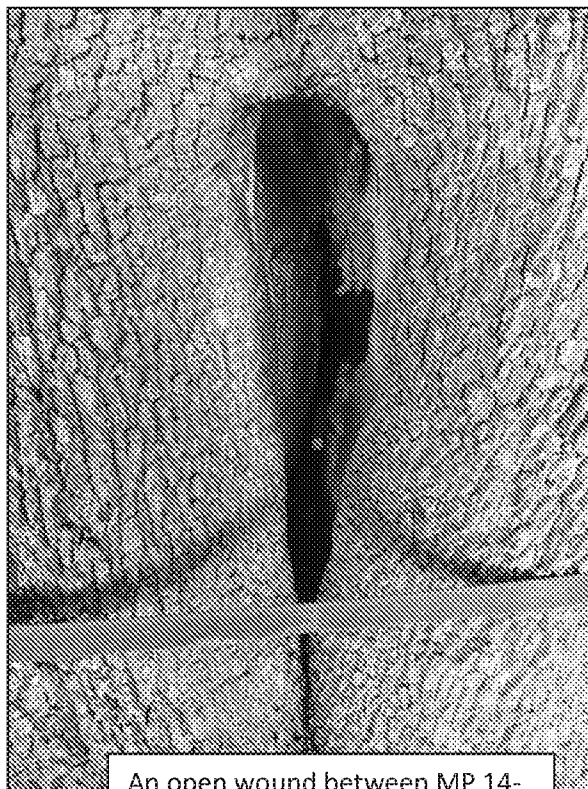
The TreeTronic uses low-level electrical current, induced between adjacent measuring points, to investigate the chemical and physical properties of the wood. The result of the measurement is a map of the electrical resistance, which is displayed in a similar form to Picus measurements, as a colour-shift image of the part of the stem being investigated.

Electrical conductivity / resistivity in the stem is influenced by properties of the wood such as cell water content and the presence of ionised particles; cracks or bark enclosed within the stem not discernible on a sonic tomogram may be more visible using this method. Used in combination, the Picus and TreeTronic allow more comprehensive assessment of the stem, particularly if decay is below the level of investigation or the results of sonic inspection are at all ambiguous.

In this instance, the most significant results on the tomogram are the areas of high relative electrical resistance, marked Area A and B on the tomogram. The former indicates a distinct area of decay and hollowing which accords with visual observation of the base (see below):



Area of apparent decay between stems, marked A. Note the 90cm long steel rod inserted up to the handle

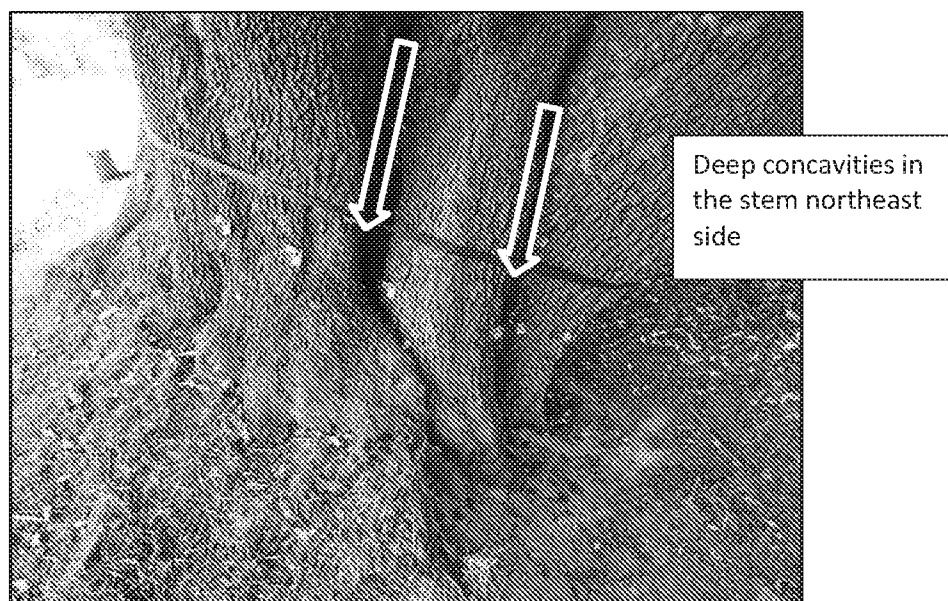


An open wound between MP 14-15, leading to a large irregular cavity

As shown by the photos above, Area A includes the soil-filled area between ascending stems towards the west side of the base and the cavity at MP 14-15. Area B appears to indicate deep concavities in the stem shape between MP 18-19 and MP 20-21, presumably marking the base of a stem that originally arose from ground level. See photo below.



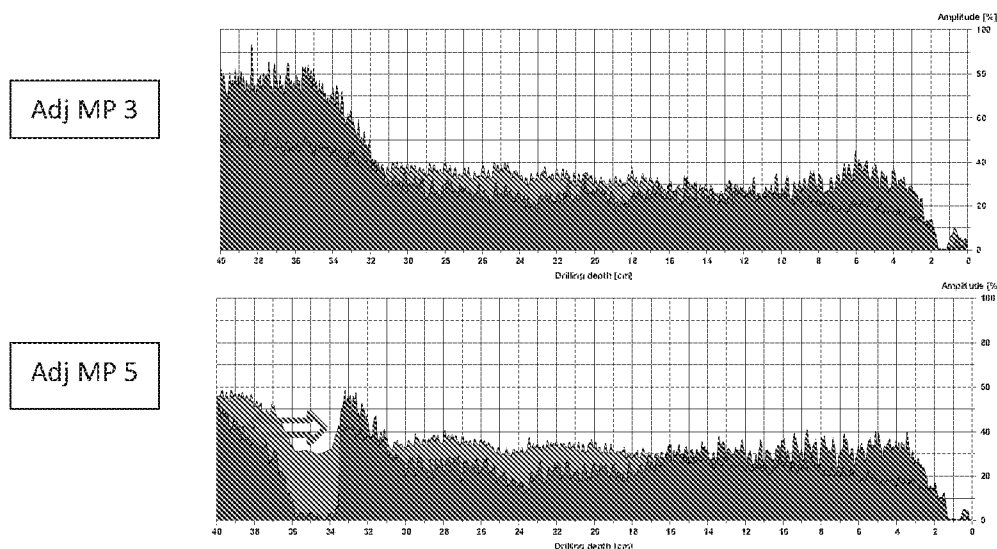
Document reference: TIR/0421/1



The IML Resi was used in a total of five selected positions around the base. This instrument measures the drilling resistance of a very fine needle to a depth of 40cm and the results represented as a graph of drilling depth against comparative resistance. The onset of decay or hollowing results in a distinct drop in resistance on the graph.

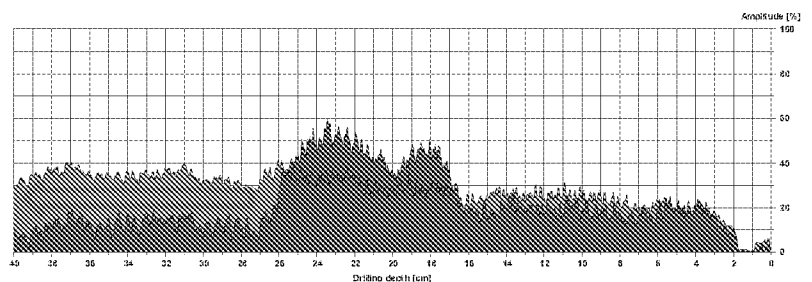
The instrument used records the resistance to drilling of two motors, one for turning the needle and another for moving the needle into the wood. In some instances drops in drilling resistance can be masked by needle drag in initial sound wood; however this version makes even subtle differences in wood density apparent.

The Resi was used at the same level as the other instruments in four positions, equivalent to adjacent MP 3, 5, between MP 11-12 and adjacent MP 17 to confirm the extent of apparent decay in Area A. These points are also marked by small arrows around the edge of the Treetric image, for information. The results are shown in this order below; drilling direction is shown right to left:

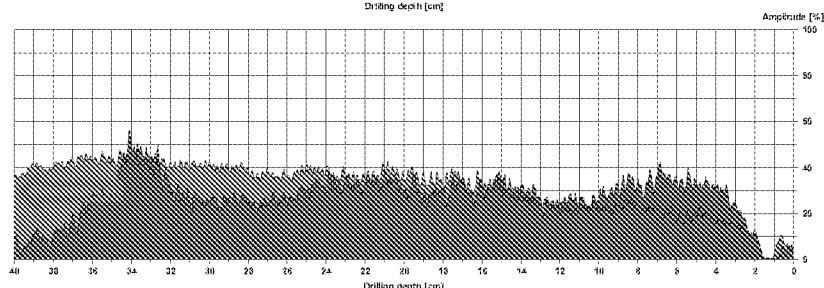


Document reference: TIR/0421/1

MP 11-12

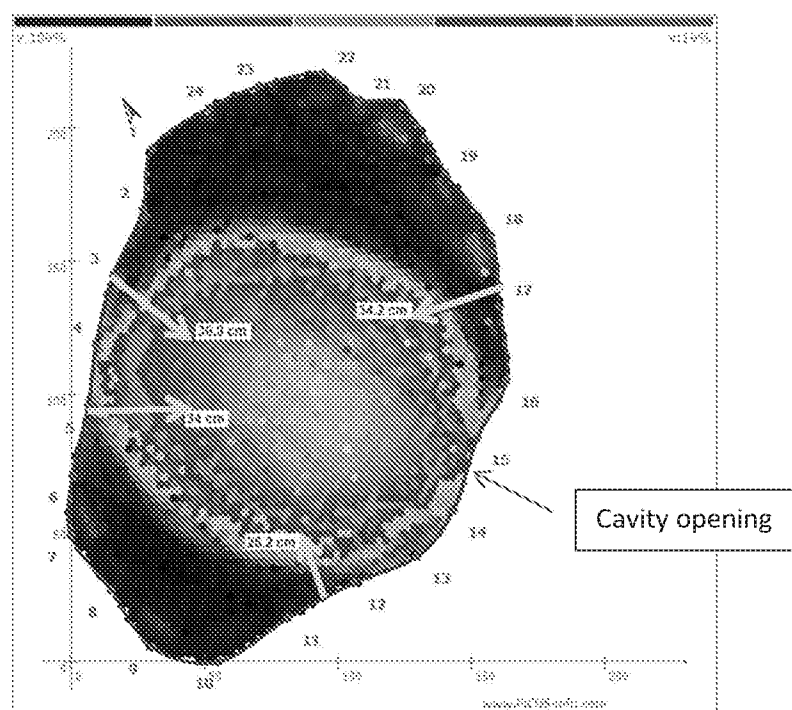


Adj MP 17



The first result, adjacent MP 3 does not indicate the onset of decay within the maximum drilling depth of 40cm; indeed drilling resistance increases significantly from a depth of 32cm onwards. The second result at MP 5 only records a brief drop into decay/hollowing at 34-36cm although resistance is likely to drop again just beyond the maximum drilling depth. The final two measurements both record decay, at depths of 26 and 35cm respectively.

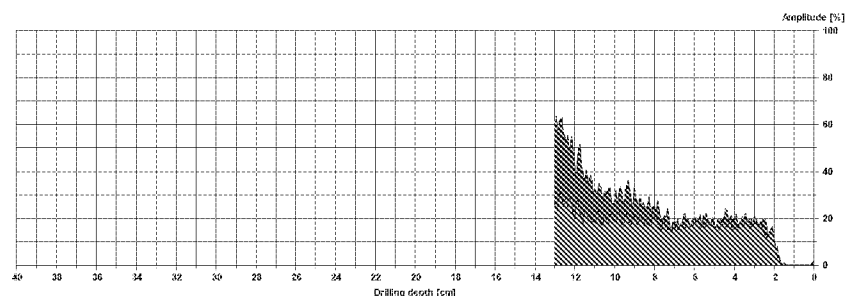
The result at MP 5 did not enter the decayed area but is likely to have been very close. However it still provides some indication of the minimum depth of sound wood at this point. For clarity the depths of sound wood are represented by scaled lines overlaid on the Picus image below:



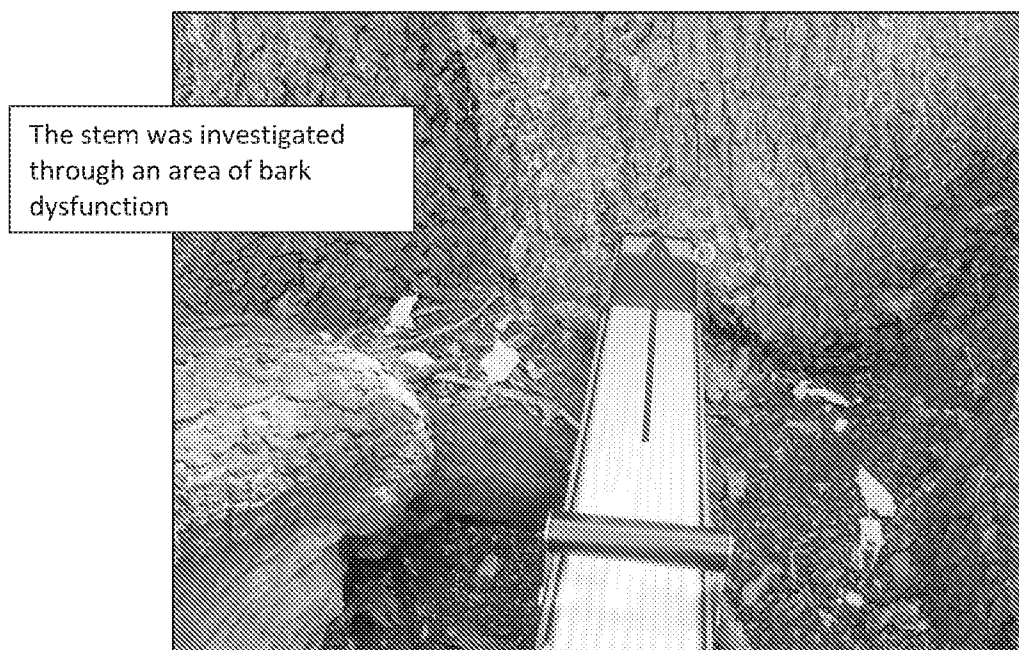
Document reference: TIR/0421/1

It is apparent from this view that exaggeration in the extent of decay/hollowing has occurred on the northwest side.

A final Resi measurement was made at the base of a large ascending limb which exhibits an area of bark dysfunction; the result does not indicate any deterioration on the outer stem and drilling was stopped at a depth of 13cm due to rapidly rising drilling resistance:



The location of this drilling is shown in a photo overleaf:

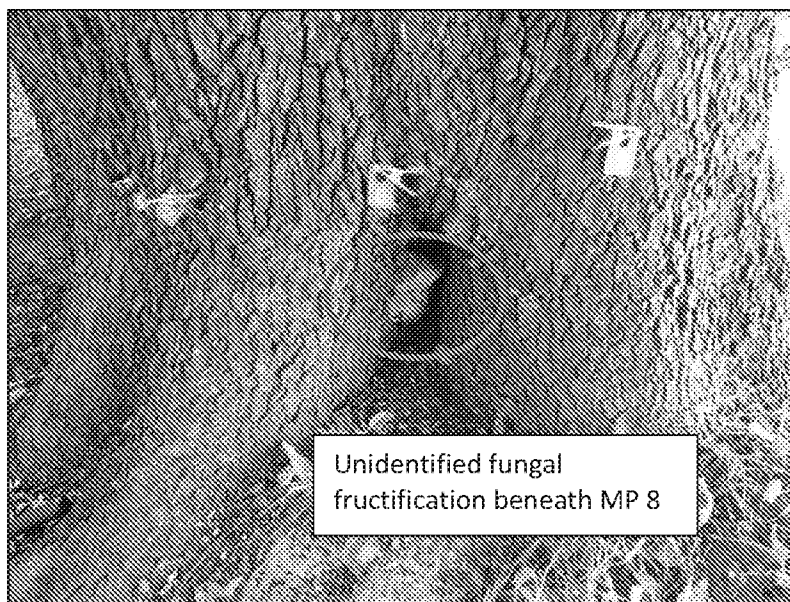


Appraisal of results:

I appreciate the differing sets of results may result in some confusion to the non-professional reader but most importantly they show that the large area of apparent decay shown by the sonic tomograph was somewhat exaggerated on the northwest side by the complex make up of lower stem.

I originally suspected that the area shown above, in the deep fork between stems, may be composed of organic material (subsequently forming soil-like material); however the results of this investigation and the presence of an emergent fungal bracket nearby, in a concavity below MP 8, suggest that active decay is likely to be present.

Document reference: TIR/0421/1



The open cavity to the east side of the stem base was probed with the steel rod to assess its depth and shape, as much as its irregular form would permit. It is apparent from the results that its presence has been incorporated into the sonic tomogram. This may not reflect the actual shape of both features but structurally they may certainly be regarded as one area, in my view.

Mr Brewster's report notes the presence of Honey Fungus rhizomorphs within the soil-filled cavity that appeared to be associated with bark dysfunction at the base of the ascending stem that was investigated using the Resi.

If Honey Fungus is the cause it is likely that further loss of functioning bark will develop in this and possibly other parts of the base. It will be important going forward that those on site inspect the lower stem for indications of this and possibly other species of fungal species. Identification of these will assist the future management of the tree. Although Honey Fungus may be associated with the bark disorder above the soil-filled cavity, it is not likely to be responsible for other discrete areas of bark discolouration.

To summarize the results, the Picus result shows a large central area of deterioration which actually represents both the soil-filled fork and the open cavity. However the TreeTronic tomogram indicates that some exaggeration may have taken place due to the irregular shape of the feature and the presence of deep bark layers between the original components of the base.

In view of the tree's position within an area of domestic housing, it is obviously prudent to ensure the size of the crown does not exceed the structural strength of the lower stem. Accordingly I support the recommendation in Mr Brewster's comprehensive report to carry out staged reduction and advise that this is commenced as soon as practicable (following receipt of any necessary consents).



Document reference: TIR/0421/1

I also advise that a repeat decay evaluation is carried out in 3-4 years to monitor the depth of sound wood around the areas of decay and hollowing.

Recommendations:

- Carry out crown thinning and reduction as informed by Mr Brewster's report
- Ensure the tree is subject to periodic visual inspection by those on site and professional assistance sought if any indications of decline in vigour or structural condition are noted
- Repeat an assessment of decay and hollowing in the combined lower stem in 3-4 years

Signed:



John Harraway *Chartered Arboriculturist*

Date:

7 April 2021

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Document reference: TIR/0421/1*