

TREE REPORT

Little Paddocks Estate, Ferring



Professional inspection

by

Bournetrees
Consultancy



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1. Introduction

Karl Washer requested Bournetrees Consultancy to carry out a tree inspection of a mature Evergreen Oak by email on the 12th November 2020. The tree is located within the south east part of Little Paddock Estate, Ferring open green and wildlife conservation area.

2. Scope of survey

The inspection is limited to visual observation and assessment only which has been carried out at the time of the site visit which in this case is 12th December 2020 10.30-12.30pm. The tree inspection has been carried out in accordance with the principles described in Matheny & Clarks' (1994) Visual Tree Assessment.

The inspection will identify defects, structural integrity and health of the tree from a ground visual inspection. No climbing has been undertaken. Where the presence of decay is found to be significant and the visual assessment cannot determine its extent then the report will recommend further investigative works. This may include the use and interpretation of a specialist detection device such as an IML Resistograph drill to determine extent of decay and potential adverse effects upon the trees' structural integrity.

3. General description of tree

Common Name	Latin Name	Dia at 0.5m of main stem	Tree Height	Crown radial average spread NESW	Crown height from ground	Amenity Rating ABCR (BS5837)
Evergreen Oak	<i>Quercus ilex</i>	1.8m	17m	8m	3.5m	B (defects present)

Table 1.

The tree is an Evergreen (Holm) Oak (*Quercus ilex*), a non native of the UK and probably introduced into this country in the 1500s. It has a 1.8m diameter main stem diameter (measured 0.5m from the ground). When compared with other Evergreen Oak tree main stems in the local region (Ferringham Road Evergreen Oak pollards see below) it is considered unusually large.



Picture 1, Ferringham Road Holm Oak

The estimated age of the tree is at least 100 years and possible part of an older estate, for example planted within the grounds of East Ferring House (Picture 2) dated 1896-1910 and red circle showing rough location of Little Paddocks).



Picture 2, old map showing previous land layout prior to Little Paddocks.

The tree grows on a bank that would have existed before the tree was planted. The tree has been measured with a height of 17m and an average radial spread to all cardinal point of 8m from its main stem. The crown appears to be complete and in full leaf (Table 1.). No evidence of sparseness, disease or dieback of the crown was found whilst observing at a distance. The main stem is stocky and then divides into several primary branches at 1.2m from the ground which have been individually identified as part of the inspection (Section 7. Primary Branch Structure).

4. Ground inspection

Karl explained the sites proneness to becoming waterlogged and which may have contributed to the failure of large mature trees in the north central location of the green (Monterey Pine and others). It is fortunate that the Evergreen Oak grows on top of the bank (see Picture 3), possibly advantageous as most of its roots would not be susceptible to the adverse effects of waterlogged lower lying soils can bring.

The ground beneath the tree canopy is mostly of grass with a good leaf mulch layer. No visible roots and mower damage was found amongst the leaf and grass. The road does encroach into the southern half part of the crown with evidence of bark damage caused by high vehicles passing beneath (Picture 3). The area appears to be relatively low occupancy and low usage and the report is based upon this site observation. Had the tree been located adjacent to the A27 for example then a different target/risk analogy would have been considered appropriate for the tree and of its future maintenance.



Picture 3, showing area impacted by the passage of high vehicles.

5. Main Stem

The main stem is unusually large and short (Picture 4). Initially the tree was thought to consist of several evergreen oak stems grown together as 'bunch planting'. On closer inspection there were no divisions, breaks or fissures. The bark has complete connectivity near its base surrounding the whole main stem circumference. The low stocky main stem with low continuous smooth crown periphery is advantageous. The aerodynamic profile can resist harsh winds from the south, with additional shelter provided by trees to the east, north and west.



Picture 4, shows short and stocky main stem with low developed branch structure.

SOUTH FACING MAIN STEM



Picture 5, showing areas identified as defects.

The South facing main stem area showing 4 defects in picture 5 and further described below.

- Area 1; mottling gingering of bark, considered dysfunction.
- Area 2; a crease or ripple of bark with pronounce growth, caused by two opposing stem flexions. No separation, bacterial exudation or seepage found.
- Area 3; 50cm x 15cm open cavity with rolling thick cambium and healthy bark growth. The cavity extends into the heart of the tree in the location. Good healthy growth response surrounding the cavity wall. Potential habitation for wildlife.
- Area 4; small area of mottled bark below an old pruning wound which has now occluded (20cm x 15cm) indicates bark dysfunction which is localised. Regular monitoring will determine whether this area increases in size.

WEST FACING MAIN STEM



Picture 6, showing areas identified as defective.

The West facing main stem area showing 4 defects and fungal fruiting body in picture 6 and described further below.

- Area 5; mottling gingering of bark below a large cavity of a primary branch extending northwards. The branch cavity has possibly disrupted sap flow to cause cambial disruption/bark dysfunction.
- Area 6; Between two healthy buttress roots there is a shallow cavity and with the presence of a fruiting fungal body (see red arrow in picture 7 below). This is possibly a juvenile fruiting body of *Perennipora fraxinea*. The nature of decay causes an intense white rot at the main stem base of its host. Although it appears small the wood decay is likely to extend further into the centre of the main stem. It is not possible to determine how extensive this is from outward observation which a decay detection device should determine.



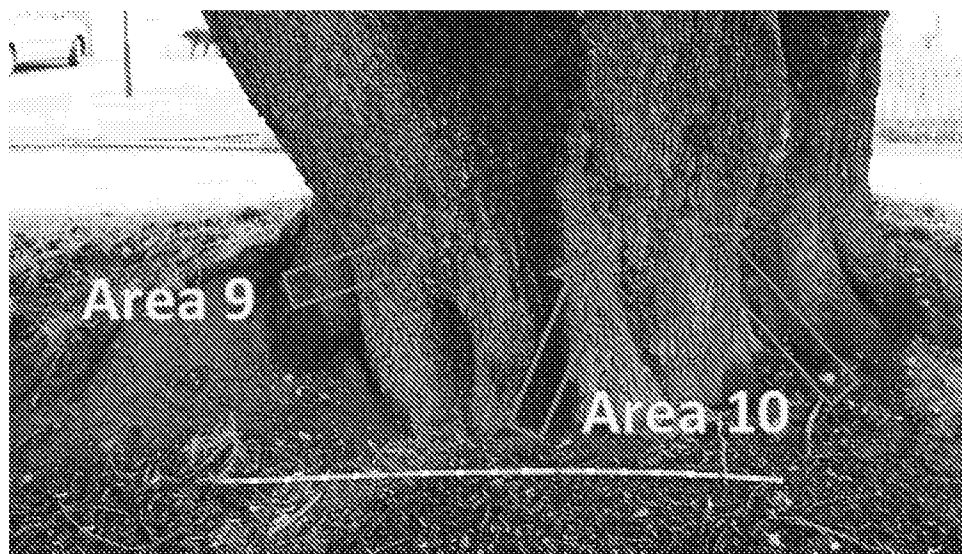
Picture 7, a fungal fruiting body between buttress roots facing west.

- Area 7; there is a narrow longitudinal girdling of bark running along the outside of the main stem approximately 3m in length. No separation, bacterial exudation or seepage from this area was found. The bark dysfunction is possibly linked with the fungal fruiting body and disruption of vascular cambium columns/vessels.
- Area 8; A pronounced bulge observed from this angle is the result of previous pruning of branches extending towards the road (Picture 8 and red arrows showing wound locations). One wound has healed, the other is becoming a cavity.



Picture 8, previous poor reaction to historic pruning.

NORTH FACING MAIN STEM

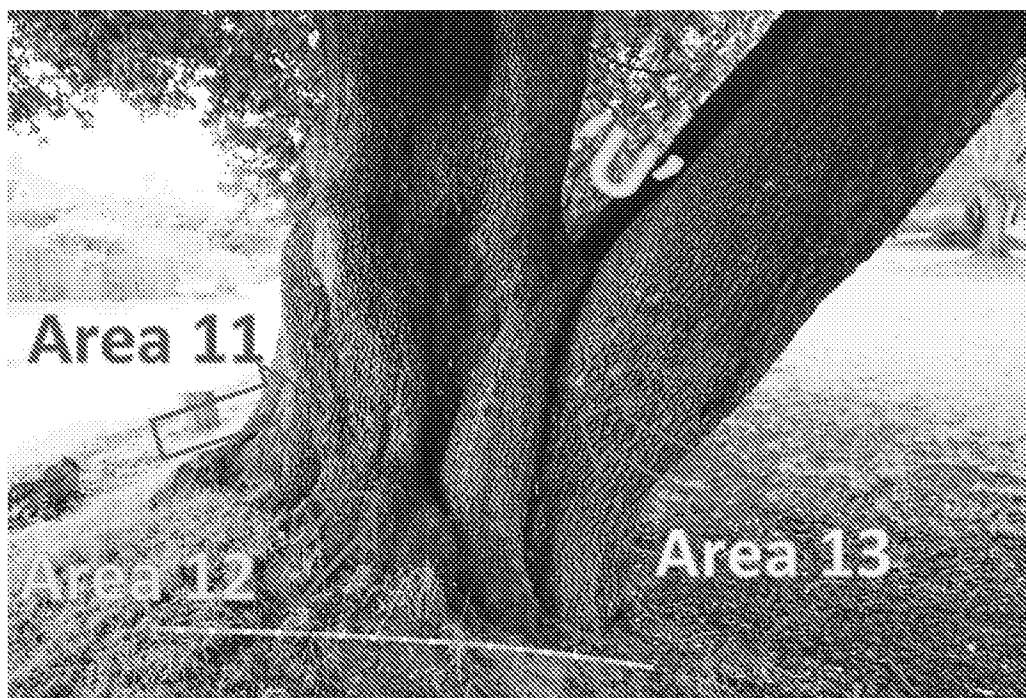


Picture 9, showing areas identified as defective.

The North facing main stem area shows 2 areas of bark dysfunction (Picture 9), described below.

- Area 9 and Area 10; show gingering dysfunctional bark and 'pitting' where buttress root formation has occurred below. This is a possible reaction strengthen an area becoming weak to the deterioration of wood tissue, and/or need to retain connectivity with the live crown portion and roots.

EAST FACING MAIN STEM



Picture 10, showing 3 areas of concern and strong 'U' junction affected by bark fold anomaly.

The East facing main stem area with bark dysfunction and 'folds', described below.

- Area 11; showing gingering dysfunctional bark. This is adjacent to Area 4, the occluded pruning wound and main stem cavity which faces north.
- Area 12; a deep fold formation with no decay but some minor bark dysfunction.
- Area 13; a deep fold, which appears to separate the primary branch (PB3) from its main stem. A closer inspection did not detect bacterial staining or decay, suggesting it is separating. There is some minor dysfunctional bark and this is one area to monitor. Fortunately, PB3 leans away from the road.
- 'U' Junction; this is an area described above a branch attaching to its parent branch/stem forming a strong union. The fold between both main stem and PB3 with additional weight is a concern and one to monitor for signs of separation. Reducing the branch should help lessen this possibility.

CENTRAL MAIN STEM

Soil has collected between the primary branches that divide from the main stem at 1.2m from the bank. Aerial roots from one primary branch has developed and has grown into the collected soil (Pictures 11 & 12).



Picture 11 and 12 above showing depth of steel probe into main stem cavity.

The steel probe (0.9m) was inserted fully into the soil. No resistance was found at this depth suggesting the central main stem wood core has deteriorate and not present. It is not possible from an outward visual inspection to determine the amount of the main stem core remains. This is important to determine what remain wood tissues remain to support the main branching structure. A decay detection device should help with this assessment and what remains of the residual wood shell, thickness and strength.

A large area of bark facing north from one of the primary branches (PB4) has become dysfunctional with 'gingering' mottled appearance (Picture 13 & 14). Fungal rhizomorph were found in the soil identified as *Armillaria spp.* This was confirmed by crushing the black structures between the fingers to reveal a 'mushroom' odour.



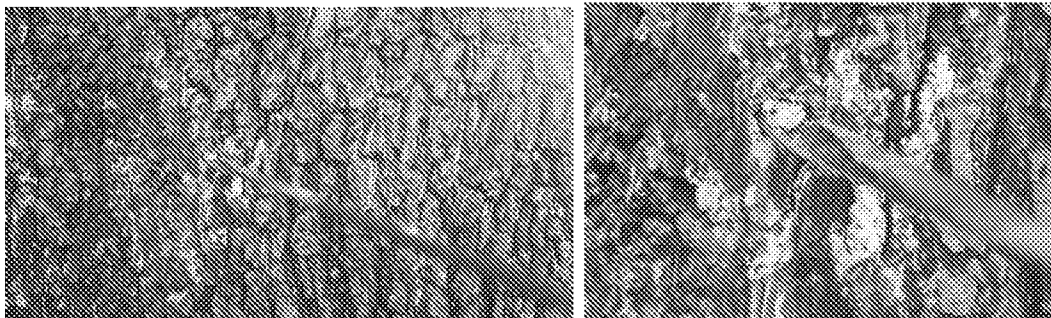
Picture 13 & 14 showing location of the fungal strands.

The presence of the fungal rhizomorph structures in the soil is a concern, associated with *Armillaria spp.* a known tree parasite (Picture 15). Click on this link for further information: [Armillaria mellea – Wood Decay Fungi of Living Trees \(treerot.com\)](http://treerot.com/Armillaria_mellea_-_Wood_Decay_Fungi_of_Living_Trees)



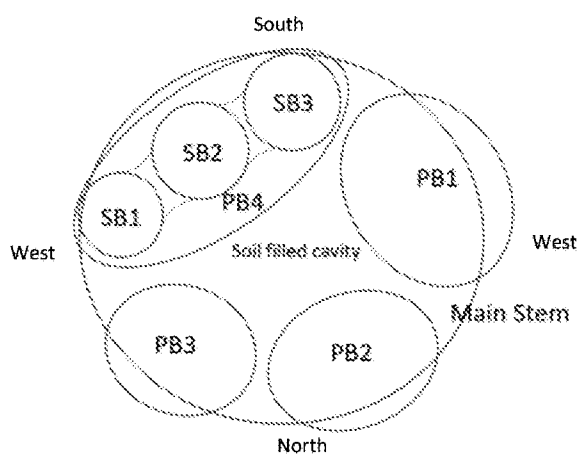
Picture 15, Honey Fungus strands taken from the main stem soil filled cavity.

A steel auger shallow drilled into gingering mottle bark area above the location of the Honey Fungus rhizomorphs to reveal powdery dry wood 'shavings' (Picture 16 & 17). This was carried out to demonstrate why the gingering mottle bark areas are considered dysfunctional as no evidence of live, underlying sappy cambium was found. Similar gingering discolorations found in patches throughout the tree would likely produce the same results, hence why they are considered 'dysfunctional' as dead bark patches.



Picture 16 and 17, augured area to reveal dead non-living cambium beneath bark.

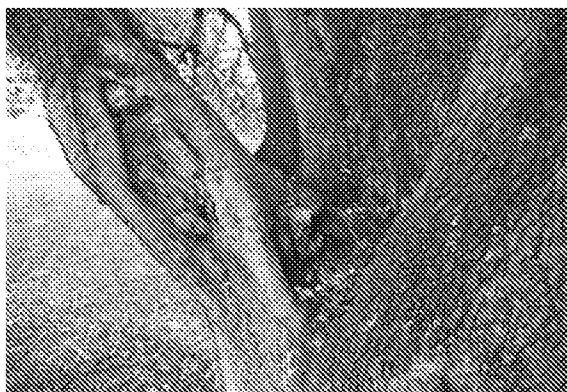
6. Primary branches and foliage



Picture 18, showing location of the major branches emanating from the main stem.

Diagram in Picture 18 above identifies all primary branching structures growing from the single at 1.2m from the main stem, orientated with the top facing south.

- PB1 Divides into two subsidiary branches. Its basal area appears healthy, the upper crown is sparse.
- PB2 has multiple old bark wounds where decay is present (Picture 19). Aerial roots have developed and is growing into the soil filled main stem cavity.



Picture 19, showing wounds and decay at base of PB2

- The top of the PB2 shows a longitudinal cavity running at least 1m, having a diameter of 10cm (Picture 20). A ridge of reaction wood growth has formed either side of the cavity adding strength to an otherwise weakened branch.



Picture 20, showing PB2 with ribbing of living wood tissue adjacent to decay cavity.

- PB3 is located close to PB2 (Picture 21) and smaller in size than PB1 & PB4. Both are similar in proportion to each other extending northwards. PB3 has no cavity formation but there is a slight pronounced double rib of supportive reaction wood running longitudinally.



Picture 21, showing both PB2 (having decay) and PB3 (slight central dip and raised outer rib)

- PB4, Picture 22 below shows extent of dysfunctional bark affecting this primary branch and measures 80cm x 25cm. PB4 has a diameter of 60cm and further divides into three subsidiary branches to form the crown.



Picture 22, extent of dysfunctional bark



Picture 23, showing sparse foliage of the crown

- The crown shows the crown is sparse with 10-15% loss of foliage. There is also a large dead branch and dysfunctional bark which has been identified by the red arrows in Picture 23 and Picture 24.

CROWN CONDITION: The crown comprises previous lopped branches where multiple dense branch growth occur around a height of 12m. the crown foliage has grown from a previous lopping of branches at approximately 12m from the ground. Deterioration in the form of sparse foliage and large dead branch has occurred suggesting a decline in the health of the tree.



Picture 24, identifies the large dead limb from PB4.

7. Overall health and structural condition

The tree has been assessed to provide an overall impression of its health and structure. There are some veteran characteristics which appear with old trees that have survived beyond their expected average age. Such trees are highly valued and rare in the UK. Managing veteran trees requires specific skills and a tolerance of the local populous to allow their appropriate and continued protection.

The tree contains cavities at the base, primary branches and higher in the subsidiary branch structure. There is localised fruiting body and many patches of gingering, dysfunctional bark. From the visual tree assessment there appears to be no evidence to suggest that the Holm Oak would imminently collapse. However, there is a potential risk of further deterioration and likelihood of failure if the tree is not appropriately managed. The sparseness of foliage indicates a tree under stress and pruning is desirable to try and stimulate the development of a lower canopy by carrying out a phased reduction.

8. Recommendation according to inspection

As demonstrated by using the steel probe, the main stem core has decayed. It is not possible to know how extensive the decay is and the wood quality forming the residual wall. Further tests using a decay detection drill is recommended to provide detail of the above, particularly in those areas near to the fruiting body, cavity and dysfunctional bark.

Yearly monitoring of the tree should be carried out to ensure that any outward deterioration beyond what has already occurred can be identified. Monitoring for example can help to determine spread of bark dysfunction, fungal fruiting body and size, decay progression within the cavities and response to growth after pruning.

9. Tree work consideration

Reducing the canopy is recommended as an attempt to thin the upper crown structure, eventually to lower the crown in time and whilst retaining a high percentage of foliage. The eventually lowering of the crown should be accomplished over a 15-20-year period, depending on favourable growth response from the pruning cuts, avoiding overly stressing the tree. If carried out correctly the tree will continue to resist/slow the spread of bark dysfunction and decay by continuing to produce sufficient anti-fungal compounds in the woody xylem and phloem tissues.

The reduction should begin in the 1st phase by removing a select proportion of branches in the upper crown to leave a minimum 5cm proud of the 'target cut' (Picture 29). The following pictures (25-28) provide examples marked as a Red Bar of where to carry out the initial cuts. These pruning points will then be monitored to determine favourable growth response from the area of dormant buds (5cm protuberance) before the next phased branch removals commence in 3 years.

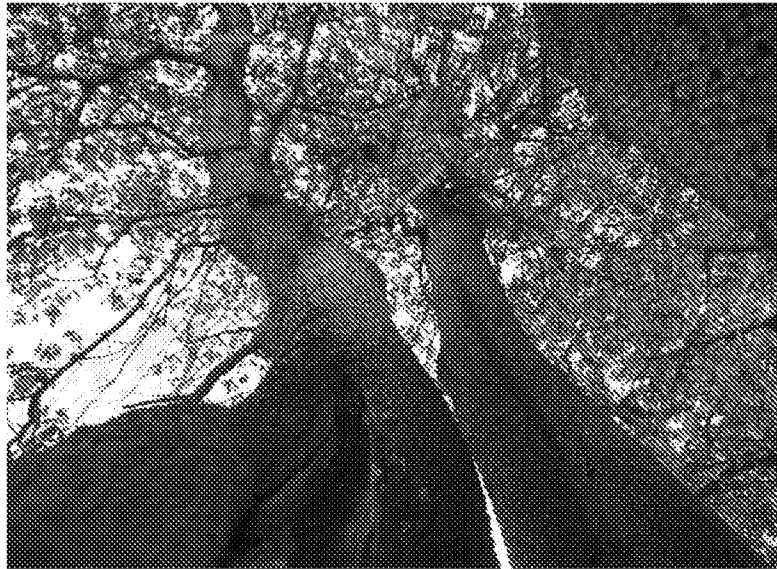


Picture 25, The upper crown part which grows toward the south.

Cutting large select branches whilst retaining others will provide a mild shock and stimulate new growth within and lower in the canopy. Shoot emergence should occur from the 5cm branch protuberance beyond the 'target cut'.



Picture 26, crown area on the south side



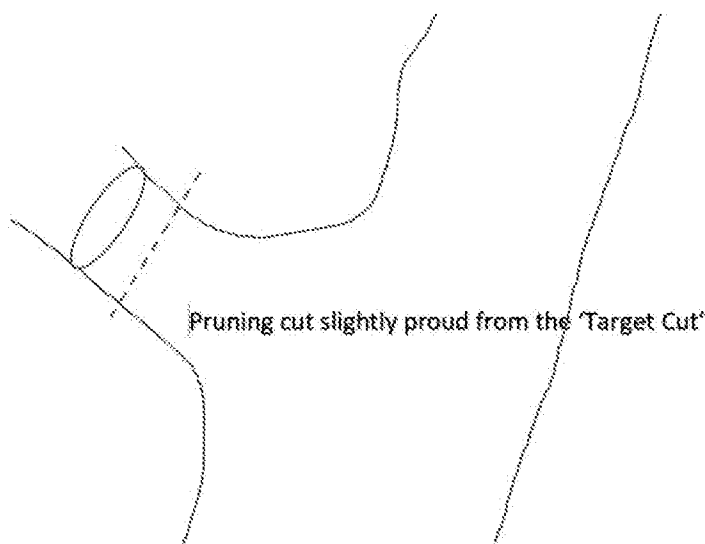
Picture 27, crown areas of PB2 and PB3



Picture 28, crown area of PB4 and PB1

Some of the branches to be removed will create wound sizes greater than 300mm in diameter and should therefore be carefully lowered to the ground without causing damage to the remaining branches, bark and lower crown. After 3 years of the selective branch removal the crown response growth should be inspected to determine whether the previously cuts have stimulated sufficient growth to continue into the second phase of reductions.

The final cutting of each selected branch should provide a minimum 5cm stub in order to allow dormant buds to grow. The minimum stub length should be at least 5cm proud of the 'Target Cut'. At this stage there should be no selective removal of branches within the lower half of the crown.



Picture 29, showing the dashed target cut and the desired 5cm protuberance.

Branches which show bark damage caused by highway vehicle impacts should be reduced back to the edge of the road. It is recommended that all thin and flexible branches and twigs remaining unless they obscured road visibility for vehicle users.

10. Report limitation.

No one tree is ever 100% and they will be subject to constant physiological and environmental stress and change, according to climatic conditions, decay, disease and other natural/unnatural events.

This report is a brief visual snapshot of the day and cannot guarantee the tree will remain in a state of limbo. Therefore, the report should be considered relevant for 6 months beyond which time a further inspection to monitoring for example progress of existing disease, and noting any significant changes. There is the possibility that its health and condition could rapidly deteriorate due to unforeseen internal/external deterioration. The recommendations provided in the report are for your consideration based upon a qualified arboriculturists experience and knowledge. It is therefore your responsibility to decide whether to act upon these recommendations. This would include seeking further advice from other tree professionals such as those who are adept in the use and interpretation of decay detection devices and software.

11. References

Lonsdale, D. 'Principles of tree hazard assessment and management' (1999)

Weber, K., Mattheck, C. 'Manual of wood decays in trees' (2003)

Mattheck, C. 'The body language of trees, handbook of failure analysis (1995)

Read, H, J. 'Veteran trees: a guide to good management' (2000)