



Tree Risk Management Appraisal

at



**Six Sites under the Management
of Aughton Parish Council, Aughton,
Lancashire**

Prepared by:

Bowland 
Tree Consultancy Ltd

October 2023

**TREE RISK MANAGEMENT APPRAISAL
SIX SITES, AUGHTON PARISH COUNCIL, AUGHTON**

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**TREE RISK MANAGEMENT APPRAISAL
SIX SITES, AUGHTON PARISH COUNCIL, AUGHTON**

PROJECT DETAILS

Project No.: BTC2558

Sites: Granville Park War Memorial, L39 5DS
William Arnold Silcock Memorial Playing Field, L39 5DJ
Rachel Taylor Memorial Playing Field, L39 5DE
Redsands Park and Play area, L39 4SQ
The Common & The Precinct, L39 5DW
Delph Quarry Woodland, L39 5EB

Survey Type: Negative Recording Walkover Tree Survey

Tree(s) Considered: Those within sites identified by client

Report Time Frame: 12 months from date of issue

Next Inspection Date: ≈18 months from date of issue

Client: Aughton Parish Council

Survey Dates: 18 October 2023

Surveyor: Ryan Gledhill FdSc MArborA

Report Prepared by: Ryan Gledhill FdSc MArborA

Report Checked by: Joseph Lambert BSc(Hons) FdSc MArborA

Date of Issue: 31 October 2022

Version No: 1

1. CIVIL LAW REGARDING TREE OWNERSHIP AND DUTY OF CARE

- 1.1 Under civil law the owner of the land on which a tree stands, together with any party who has control over the tree's management, has a duty of care to take reasonable steps to prevent or minimise the risk of personal injury and/or damage to property from any tree located within the curtilage of the land in question.
- 1.2 In turn, it is accepted that these steps should normally include commissioning a qualified and experienced arboriculturist to survey the tree in order to identify and appraise any risk of harm to persons or damage to property that it may present and, where unacceptable risks are identified, taking suitable remedial action to negate or reduce those risks accordingly.

2. QTRA METHODOLOGY OVERVIEW AND APPLICATION IN MANAGEMENT DECISIONS

- 2.1 A survey was carried out in order to consider the general structural stability of the trees at the site and the associated risk of harm that they pose to persons and/or damage that they pose to property and, from this information, to make management recommendations to reduce any risks identified to be unacceptable to a level that is considered to be either tolerable or broadly acceptable (see Table 1, below).
- 2.2 The Quantified Tree Risk Assessment (QTRA) methodology utilised for the tree survey (see appended QTRA Practice Note for more details) quantifies the three components of tree failure risk, which are:
- Target* (something with potential to be harmed and/or damaged by the mechanical failure of tree parts);
 - Impact Potential*; and
 - Probability of Failure* (within the coming year).
- 2.3 The product of the three component values is the annualised 'Risk of Harm', which is a combined measure of the likelihood and the consequence of tree failure considered in terms of the loss within the coming year, and is expressed as a probability. In applying the 'Tolerability of Risk Framework' (ToR) the QTRA methodology divides the 'Risk of Harm' into three threshold values, being;
- Unacceptable* (i.e. >1/1,000), which is unacceptable and will not ordinarily be tolerated;
 - Tolerable* (i.e. between 1/1,000,000 and 1/1,000, where the Risk of Harm will be tolerable if it is As Low As Reasonably Practicable (ALARP); but a Risk of Harm 1/10,000 or greater will not ordinarily be Tolerable where it is imposed on others, such as the public. In the Tolerable range management decisions are informed by consideration of the benefits and costs of risk control, including benefits provided by trees that would be lost to risk control measures; and
 - Broadly Acceptable* (<1/1,000,000), which is already ALARP.
- 2.4 The QTRA advisory thresholds, (see Table 1, below) are proposed as a reasonable approach to balancing safety from falling trees with the costs of risk reduction. This approach takes account of the principles of ALARP and ToR, but does not dictate how these principles should be applied. While the thresholds can be the foundation of a robust policy for tree risk management, tree managers should make decisions based on their own situation, values and resources.

Table 1: QTRA Advisory Risk Thresholds:

Threshold	Description	Action
Risk of harm of 1/1,000 or greater	Unacceptable - Risks will not ordinarily be tolerated	<ul style="list-style-type: none"> ▪ Control the risk
Risk of harm between 1/1,000 and 1/10,000	Unacceptable (where imposed on others) - Risks will not ordinarily be tolerated	<ul style="list-style-type: none"> ▪ Control the risk ▪ Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	<ul style="list-style-type: none"> ▪ Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value ▪ Review the risk
Risk of harm between 1/10,000 and 1/1,000,000	Tolerable (where imposed on others) - Risks are tolerable if ALARP	<ul style="list-style-type: none"> ▪ Assess costs and benefits of risk control ▪ Control the risk only where a significant benefit might be achieved at reasonable cost ▪ Review the risk
Risk of harm less than 1/1,000,000	Broadly Acceptable - Risk is already ALARP	<ul style="list-style-type: none"> ▪ No action currently required ▪ Review the risk

- 2.5 As detailed in Table 1, a Risk of Harm less than 1/1,000,000 is Broadly Acceptable and already ALARP (i.e. 'as low as reasonably practicable'). A Risk of Harm 1/1,000 or greater is unacceptable and will not

ordinarily be tolerated. Between these two thresholds, the Risk of Harm is in the Tolerable region of the ToR Framework and will be tolerable if it is ALARP, but a Risk of Harm 1/10,000 or greater will not ordinarily be Tolerable where it is imposed on others, such as the public. Here, management decisions are informed by consideration of the benefits and costs of risk control, including benefits provided by trees that would be lost to risk control measures.

- 2.6 In respect of the above the assessor (i.e. Bowland Tree Consultancy Ltd) may consider the costs of risk control when providing options for management if specifically asked to do so, but the tree owner/manager, who owns the risk and therefore exercises control over the costs, must consider the balance and make the final management decision(s).

3. SUMMARY OF SURVEY FINDINGS AND RECOMMENDATIONS

- 3.1 A negative recording 'Walkover Tree Survey' (see 'Schedule of Operations' appended to agreed project quote) was undertaken on 18 October 2023 at six sites identified by the client Aughton Parish Council. The survey undertaken was a review of the previous walkover tree survey completed in September 2022.
- 3.2 The sites considered were identified through a supplied list, and verbal instructions, by the instructing client's representative Irene Roberts, as follows:
- Granville Park War Memorial
 - William Arnold Silcock Memorial Playing Field and Play Area
 - Rachel Taylor Memorial Playing Field and Play Area
 - Redsands Park and Play Area
 - The Common & The Precinct
 - Delph Quarry Woodland
- 3.3 As a negative recording survey only trees identified to have observable structural defects and a subsequent 'Risk of Harm' that falls within the 'Unacceptable' range were recorded (see 'Schedule of Operations' appended to agreed project quote for more details in this respect).
- 3.4 The survey identified 28 individual trees, 17 group of trees and one woodland, as detailed on the appended Tree Survey Plans. The surveyed trees consist of various broadleaf and coniferous species, including Ash, Common Oak, Scots Pine and Beech, in the early-mature to post-mature age range, with heights of up to approximately 23 metres, stem diameters of up to approximately 1300 millimetres, and maximum diametrical crown spreads up to approximately 20 metres.
- 3.5 The sites under consideration consisted of four public parks, a war memorial site and public woodland area located on a historic quarry site, all located north-east of the village of Aughton. Excluding the woodland area, the remaining sites exhibited formal management of vegetation and public amenities as well as constructed hard standing public footpaths. In regards to the woodland area, the footpaths are comprised of compacted soil, subsequent of foot traffic throughout the site. The woodland evidently has fluctuating occupancy levels, with highest occupancy area located around the central clearing of the site.
- 3.6 As a component of this appraisal various targets were identified to be within falling distances of the surveyed trees, including, but not restricted to, pedestrians using the various public rights of way, moving vehicles and their occupants using public highways, and various items of property including buildings, parked vehicles, overhead cables and boundary features such as fences and walls.
- 3.7 Furthermore, a widespread presence of Ash Dieback Disease (*Hymenoscyphus fraxineus*) was noted throughout the Ash tree population, both within the sites under consideration and the wider local landscape. Consequently, Ash trees exhibiting substantial decline as a result of the disease, and within falling distances of identifiable targets under obvious moderate to high usage were recorded as a component of the survey.
- 3.8 In turn, as a guide, the surveyed Ash trees have been assessed in accordance with the following scales of approximate percentages of remaining canopy at the time of viewing:
- Class 0 – 100% canopy - Healthy trees displaying good vitality;
 - Class 1 – 75% canopy - Weakened trees show treetop shoots in the degeneration phase;
 - Class 2 – 50% canopy – Severely weakened trees exhibiting a significant reduction in vitality, e.g. with bushy and lumpy accumulation of growth; and
 - Class 3 – 25% canopy – Trees in a state of severe decline, e.g. with large dead canopy areas and twigs and branches starting to break off.

- 3.9 With regard to these classifications it is emphasised that trees falling within classes 2 and 3 are normally recommended for risk management remedial works where there are targets exist within falling distance of said trees.
- 3.10 In turn, as highlighted with the colours red and orange in the appended Tree Survey Schedule and in Table 2, below, the risk assessment established that two trees have calculated QTRA risk indices that fall within the unacceptable risk threshold range of 1/10,000 or over (please refer to Table 1, on the previous page, with regard to advisory tree risk thresholds). Consequently, as also detailed in the TSS, management recommendations have been made in order to negate the risk that these trees present, with both the trees and groups being highlighted with the colour orange in Table 2, in the TSS, and on the TSP.
- 3.11 However, as also detailed in Table 2, works have been recommended to various trees with calculated QTRA risk indices that fall within the tolerable risk threshold range (as highlighted with the colour yellow) or the broadly acceptable risk threshold range (as highlighted with the colour green), either for general non-risk management related reasons (as denoted with the suffix (M)), to mitigate risk to a fixed structure (as denoted with the suffix (S)) or, where applicable, to enable applicable trees to be inspected in further detail for risk assessment purposes (as denoted with the suffix (I)).

Table 2: Tree Work Recommendations:

No.	Species	Management Works Recommended*	Responsible Professional	Work Priority
T4	Rowan	1. Remove tree due to identified increased risk of failure and subsequent risk of harm to persons.	1. Tree Contractor	1. Moderate
T11	Common Hawthorn	1. Remove tree due to identified increased risk of failure and subsequent risk of harm to persons.	1. Tree contractor	1. Moderate
T22	Common Hawthorn	1. Remove tree due to identified increased risk of failure and subsequent risk of harm to persons.	1. Tree contractor	1. Moderate
T24	Common Beech	1. Remove tree due to evident state of decline. NB: Main stem and lower primary branches may be retained at suitable height as standing deadwood of habitat value.	1. Tree Contractor	1. High
T26	Common Beech	1. Remove tree due to evident state of decline. NB: Main stem may be retained at suitable height as standing deadwood of habitat value.	1. Tree Contractor	1. High
T28	Scots Pine	1. Remove deadwood >35mm diameter over vehicle track, due to identified increased risk of failure and subsequent risk of harm to persons.	1. Tree contractor	1. Moderate
G7	Mixed Broadleaf Species	1. Reduce overhanging canopies back to boundary, due to ongoing complaints by neighbouring resident (M).	1. Tree contractor	1. Low
W1	Mixed Broadleaf and Conifer Species	1. Remove deadwood >35mm diameter over desire lines and high use areas, due to identified increased risk of failure and subsequent risk of harm to persons.	1. Tree contractor	1. Moderate

*Note: it shall be the client's responsibility to arrange contact with the applicable local council's planning department in order to check for the presence of any statutory tree protection measures, such as the site's location within a Conservation Area and/or the presence of any Tree Preservation Orders, prior to scheduling or carrying out any tree works

- 3.12 Table 3, overleaf, details the trees that are recommended for more detailed inspections for risk management related reasons following any works recommended in Table 2, along with their accompanying re-inspection schedule.

Table 3: Tree Re-Inspection Recommendations:

No.	Species	Re-Inspection Recommendations*	When?
T6	Wild Cherry	1. Monitor structural and physiological condition of tree annually as part of cyclical inspection programme.	12 months of date of report
W1	Mixed Broadleaf and Conifer Species	2. Re-inspect structural and physiological condition of woodland annually as part of cyclical inspection programme	12 months of date of report

*Note: Unless otherwise specified, all inspections detailed in Table 3 are to be carried out by the project tree consultant upon

- 3.13 With regard to general arboricultural management, as noted previously, the presence of ADD was identified both within the surveyed sites and throughout the wider landscape. In this respect it should be noted that, whilst the most prominent trees close to property and paths have been identified and the risk that they pose evaluated, as per the scope of the survey, a potentially substantial number of further Ash trees on the sites are evidently succumbing to the disease. In this respect it is emphasised that some trees can succumb to the disease, following colonisation, over a relatively short timeframe of several growing seasons.
- 3.14 As such, it is strongly recommended that a planned approach be adopted by those managing the sites in order to monitor and remove any trees that succumb to the disease that are within falling distances of identifiable targets such as roads, footpaths and buildings. In turn, consideration should also be given to providing replacement trees of suitable species and in appropriate number and locations in mitigation of any Ash tree losses.
- 3.15 In consideration of the high usage of various areas of the wider site, and the associated identified targets such as pedestrians and vehicles and their occupants, alongside the stakeholders' duty of care (see paragraph 1.1) it is subsequently recommended that, as a component of the review of the tree data and recommendations included herein, consideration be given to initiating an 'Individual Tree Survey' (see 'Schedule of Operations' appended to agreed project quote) of areas with trees that are identified to be within falling distance of targets.
- 3.16 Additionally, it is strongly recommended that the client undertakes a walkover check of trees around the sites following any inclement weather events in order to identify any obvious risk features, such as broken, split or hanging branches, rootplate heave, etc., and, if identified as necessary, to then seek appropriate professional advice from a tree consultant or a tree contractor.

DISCLAIMER

Survey Limitations: Unless otherwise stated all trees are viewed from ground level using non-invasive techniques. The disclosure of hidden crown and stem defects, in particular where they may be above a reachable height or where trees are ivy clad or in areas of ground vegetation, cannot therefore be expected. All obvious defects, however, are reported. Where the QTRA Risk Index is calculated as Tolerable or Broadly Acceptable, but the tree(s) have not been adequately inspected (e.g. due to the presence of ivy and/or ground vegetation which impeded the inspection), then it is essential to follow the recommendations made in the Management Recommendations column and to have the applicable tree(s) re-inspected as recommended.

Detailed tree safety appraisals are only carried out under specific written instructions. Comments upon evident tree safety relate to the condition of said tree at the time of the survey only. The level of detail of the survey is as per the brief detailed on the Tree Survey Schedule and as per the specifics set out in the associated fee estimate for the project.

Unless otherwise stated all trees should be re-inspected annually in order to appraise their on-going mechanical integrity and physiological condition. It should, however, be recognised that tree condition is subject to change, for example due to the effects of disease, decay, high winds, development works, etc. Changes in land use or site conditions (e.g. development that increases access frequency) and the occurrence of severe weather incidents are also significant considerations with regards tree structural integrity and trees should therefore be re-assessed in the context of such changes and/or incidents and inspected at intervals relative to identified and varying site conditions and associated risks.

Where trees are located wholly or partially on neighbouring private third-party land then said land is not accessed and our inspection is therefore restricted to what can reasonably be seen from within the site. Any subsequent comments and judgments made in respect of such trees are based on these restrictions and are our preliminary opinion only. Recommendations for works to neighbouring third-party trees are only made where a potentially unacceptable risk to persons and/or property has been identified during our survey. Where significant structural defects of third-party trees are identified and associated management works are considered essential to negate any risk of harm and/or damage then we will first attempt to inform the site occupier of the issues and, if not possible, then inform the relevant Council. Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule.

The potential influence of trees upon existing or proposed buildings or other structures, resulting from the effects of their roots abstracting water from shrinkable load-bearing soils, is not considered herein.

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Statutory Tree Protection: It is the client's responsibility to check for the presence of any statutory tree protection measures, such as the site's location within a Conservation Area and/or the presence of any Tree Preservation Orders, directly with the applicable Council's planning department prior to scheduling or carrying out any tree works. In turn, it is also the client's responsibility to check for the need for a felling licence with the Forestry Commission prior to scheduling or carrying out any tree works. Bowland Tree Consultancy Ltd cannot be held responsible for any decisions made by the client to prune or remove trees where any such statutory protection exists.

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Validity: The findings and recommendations contained within this report are, providing its recommendations are observed and the site conditions are retained as per the date(s) of the survey, valid for a period of twelve months from the last survey date. This period of validity may be reduced should there be any changes in factors affecting both the surrounding environment and/or built structures in relative proximity to the trees. The condition of trees should be re-appraised directly, through a site survey, following major weather events such as storms, changes undertaken to the site's conditions, inclusive of demolition and/or ground works, or the removal of existing site vegetation, including trees.

Site:	Granville Park War Memorial, Aughton, Lancashire, L39 5DJ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T1	Common Ash	SM	15	530	11	M	<ul style="list-style-type: none"> Early displacement of public footpath hardstanding subsequent of incremental surface root growth. Stem bifurcates at a height of 4m. Previous crown lift pruning to a height of approximately 7m. Signs indicative of an early stage of decline subsequent of colonisation by Ash Dieback Disease (ADD) with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Secondary branch to 100mm diameter. T = Persons using public footpath.	2	4	5	N/A	<1M	L
T2	Common Ash	SM	18	580	11	M	<ul style="list-style-type: none"> Cavity at a height of 3m, to a diameter of approximately 230mm, subsequent of previous crown pruning works. Stem bifurcates at a height of 8m. Previous crown lift pruning to a height of approximately 10m. Signs indicative of an early stage of decline subsequent of colonisation by ADD with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Deadwood to 60mm diameter. T = Persons using public footpath.	2	4	3	50%	1M	L
T3	Common Ash	SM	14	330	8	M	<ul style="list-style-type: none"> Previously crown lifted to a height of approximately 7m. Canopy suppressed and biased south towards war memorial. Tree has significantly declined since the previous survey (2022), with the remaining canopy now falling into Class 2 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree contractor to remove tree by sectional dismantling due to continued decline subsequent of ADD, and identified increased risk of failure and subsequent risk of harm to persons. 	P = Deadwood to 50mm diameter. T = Persons visiting war memorial.	2	4	2	50%	100 K	M

HEADINGS & ABBREVIATIONS

NO. TREE/GROUP REFERENCE NUMBER. REFER TO PLAN OR NUMBERED TAGS WHERE APPLICABLE

SPECIES: COMMON NAME

AGE: Y = YOUNG, SM = SEMI MATURE, EM = EARLY MATURE, M = MATURE, PM = POST MATURE

HEIGHT: APPROXIMATELY 80% OF TREES ARE MEASURED USING AN ELECTRONIC CLINOMETER AND THE REMAINDER ESTIMATED AGAINST THE MEASURED TREES

DIAMETER: STEM DIAMETER MEASURED OR ESTIMATED AT A HEIGHT OF APPROXIMATELY 1.3 METRES

CROWN SPREAD: MEASURED OR ESTIMATED DIAMETER OF CROWN(S) AT THE WIDEST POINT

VITALITY: A MEASURE OF PHYSIOLOGICAL CONDITION WHEREBY D = DEAD, MD = MORIBUND, P = POOR, M = MODERATE, G = GOOD

MANAGEMENT: SUFFIXES: (M) = FOR GENERAL ARBORICULTURAL OR SILVICULTURAL MANAGEMENT; (S) = TO REMOVE OR REDUCE THE RISK OF DIRECT DAMAGE TO A FIXED STRUCTURE BY MEANS OF CIRCUMFERENTIAL ROOT, STEM OR BRANCH GROWTH; (I) = TO ENABLE THE TREE(S) TO BE INSPECTED FURTHER FOR RISK ASSESSMENT PURPOSES

TARGET RANGE: HIGHEST VALUE TARGET THAT THE MOST SIGNIFICANT PART LIKELY TO FAIL COULD STRIKE. RANGES 1-6. 1 = HIGH, 6 = LOW VALUE/OCCUPANCY

RISK ASSESSMENT DESCRIPTION: DESCRIPTION OF PART IDENTIFIED AS MOST LIKELY TO FAIL AND ASSOCIATED TARGET, ASSESSED IN ACCORDANCE WITH QTRA SYSTEM

SIZE RANGE: SIZE CATEGORY OF MOST SIGNIFICANT PART CONSIDERED LIKELY TO FAIL. - RANGES 1-4 WHEREBY 1 = LARGE, 4 = SMALL, P = PROPERTY

P.O.F: PROBABILITY OF FAILURE WITHIN 12 MONTHS. RANGES 1-7. 1 = HIGH, 7 = LOW

REDUCED MASS %: WHERE THE MASS OF A TREE OR BRANCH IS REDUCED BY DEGRADATION THE RISK INDEX IS MULTIPLIED TO REFLECT THE PERCENTAGE OF MASS REDUCTION

RISK INDEX: E.G. RISK INDEX 20 = RISK OF SIGNIFICANT HARM 1 IN 20,000. AN ADDITIONAL FIGURE, IN BRACKETS, MAY BE SUFFIXED 'T' REPRESENTING THE RATE OF MULTIPLE OCCUPATION OVER THE YEAR, E.G. 10(10T) REPRESENTS A RISK OF HARM 1/10,000 TO 10 OCCUPANTS OR AN EQUIVALENT MONETARY VALUE. SEE QTRA PRACTICE NOTE FOR MORE INFORMATION REGARDING COLOURS USED TO SIGNIFY RISK INDEX

WORK PRIORITY: H (HIGH) = TREE WORKS TO BE GIVEN IMMEDIATE CONSIDERATION. M (MODERATE) = TREE WORKS TO BE CARRIED OUT WITHIN 12 MONTHS OF SURVEY (TIMING MAY BE SPECIFIED IN MANAGEMENT RECOMMENDATIONS). L (LOW) = TREE WORKS THAT ARE NOT CONSIDERED ESSENTIAL FOR RISK MANAGEMENT PURPOSES, BUT ARE RECOMMENDED IN ACCORDANCE WITH PRUDENT ARBORICULTURAL MANAGEMENT (TO BE REVIEWED IN 12 MONTHS, OR SPECIFIED TIME, IF APPLICABLE). N/A = NOT APPLICABLE

Site:	William Arnold Silcock Memorial Playing Field, Aughton, Lancashire, L39 5DJ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T4	Rowan	SM	6	240	4	M	<ul style="list-style-type: none"> Approximately 70mm wide longitudinal cavity from stem base to a height of 1m, through tensile wood with evident compensatory wound wood adaptive growth. Evident internal decay within stem wound, appears to have progressed since 2022 survey. Mallet sounding indicates significant internal hollowing. Slight stem lean south towards public footpath and road. Northern canopy extents exhibit dieback and signs of a moderate stage of progressive decline. 	<ul style="list-style-type: none"> Tree contractor to remove tree due to identified increased risk of failure and subsequent risk of harm to persons. 	P = Full Stem. T = Persons using public footpath and communal land.	2	3	3	N/A	50K	M
T5	Common Lime	SM	9	360	7	G	<ul style="list-style-type: none"> Canopy suppressed and biased east over public footpath. Pruning wounds from previous crown lift management to a height of 2.5m. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Eastern canopy secondary branching to a diameter of approximately 60mm. T = Persons using public footpath.	2	4	6	N/A	<1M	L
T6	Wild Cherry	SM	8	480	8	G	<ul style="list-style-type: none"> Located within children's play area. Several white rot decay causing fungal fruiting bodies of <i>Ganoderma</i> sp. around stem base to a diameter of approximately 120mm. Nylon mallet sounding test indicates possible increase in internal hollowing to east stem base extents. Historic crown lift pruning to a height of 3m. Minor deadwood to a diameter of approximately 40mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree annually as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 40mm. T = Persons using children's play area.	2	1	5	N/A	400K	M
T7	Norway Maple	EM	6	180	4	M	<ul style="list-style-type: none"> Stem bifurcates at a height of approximately 1.8m. Several dead branch pegs at a height of 2m, to a diameter of approximately 80mm. Canopy suppressed by neighbouring tree T9. Signs of a moderate reduction in vitality and state of progressive decline. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using children's play area.	1	4	6	50%	<1M	N/A

Site:	William Arnold Silcock Memorial Playing Field, Aughton, Lancashire, L39 5DJ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T8	Wild Cherry	SM	12	380	8	M	<ul style="list-style-type: none"> Several small diameter white rot decay causing fungal fruiting bodies of <i>Ganoderma</i> sp. at stem base; nylon mallet sounding did not indicate significant internal decay. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Full stem failure at base. T = Persons using children's play area.	2	2	5	N/A	1M	N/A
T9	Norway Maple	SM	9	300	6	M	<ul style="list-style-type: none"> Stem bifurcates at a height of 2m. Previous crown lift pruning to a height of 2.5m. Canopy exhibiting a significant reduction in vitality and state of progressive decline. Moderate instances of deadwood to a diameter of approximately 60mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using public park.	2	4	5	N/A	<1M	N/A
T10	Common Oak	M	15	1000	20	M	<ul style="list-style-type: none"> Located behind boundary mesh fencing, with no access, and subsequently viewed from public park. Multiple leaders from a height of approximately 2.5m. Previous failure of >450mm diameter central leader at a height of approximately 5m, with resultant arisings processed and piled along boundary. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 150mm. T = Persons using public park.	2	3	5	N/A	<1M	N/A
T11	Common Hawthorn	SM	5	240	3	D	<ul style="list-style-type: none"> Tree is evidently dead. Sheltered within neighbouring tree canopy. 	<ul style="list-style-type: none"> Tree contractor to remove tree due to increased risk of failure and potential risk of harm to persons. 	P = Deadwood up to a diameter of approximately 50mm. T = Persons using public park.	2	4	2	N/A	50K	M
T12	Common Ash	SM	9	540	7	M	<ul style="list-style-type: none"> Signs indicative of an early stage of decline subsequent of colonisation by ADD with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Deadwood to a diameter of approximately 60mm. T = Parked vehicles.	4	P	5	N/A	<1M	N/A

Site:	William Arnold Silcock Memorial Playing Field, Aughton, Lancashire, L39 5DJ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
G1	Sycamore, Wild Cherry, Norway Maple, Hawthorn	SM	≤ 13	≤ 480	≤ 9	G	<ul style="list-style-type: none"> 18 semi-mature trees located in two close spaced parcels, separated by central area of previously felled trees; stumps still present on site. Previous crown lift pruning to a height of 4m. Mutual canopy suppression throughout group. Trees bordering area of previous felling exhibit signs of slight canopy dieback and early decline, subsequent of increased wind exposure. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme 	P = Deadwood to a diameter of approximately 100mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
G2	8no. Lombardy Poplar, 2no. Rowan, 2no. Swedish Whitebeam, 2no. Common Alder, 1no. Wild Cherry	SM	≤ 23	≤ 670	≤ 8	G	<ul style="list-style-type: none"> Moderate to loose spaced group. Instances of bark damage to basal flare subsequent of grounds maintenance machinery. Minor instances of deadwood to a diameter of approximately 70mm. Previous crown lift pruning to a height of 3m. Rowan and Alder tree exhibiting signs of upper crown dieback and early decline. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme 	P = Deadwood to a diameter of approximately 70mm. T = Persons using public park.	2	4	5	50%	<1M	N/A
G3	Ash, Silver Birch, Swedish Whitebeam, Wild Cherry, Common Alder, Broadleaf Cockspurthorn	SM	≤ 13	≤ 460	≤ 8	G	<ul style="list-style-type: none"> Close to moderate spaced linear group of 19 trees. Previously crown lifted to a height of 3m. Minor instances of deadwood to a diameter of approximately 60mm. Ash trees exhibiting signs of early decline indicative of colonisation by ADD, with remaining canopy currently falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
G4	Hybrid Black Poplar, Aspen, Beech, Ash, Common Lime	SM-M	≤ 22	≤ 940	≤ 15	G	<ul style="list-style-type: none"> Close spaced linear group along site boundary. Trees straddle boundary line and group is evidently under dual ownership. Ash trees do not exhibit signs of decline and in turn fall into Class 0 (see para. 3.7 of report). Historic secondary branch fracture wound on western Hybrid Black Poplar. Minor basal epicormic growth on Hybrid Black Poplars. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme 	P = Full stem at ground level. T = Persons using public park and neighbouring residential building.	1	4	6	N/A	<1M	N/A

Site:	William Arnold Silcock Memorial Playing Field, Aughton, Lancashire, L39 5DJ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill <small>FdSc MArborA</small>
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
G5	5no. Silver Birch, 1no. Beech	SM	≤ 9	≤ 360	≤ 7	G	<ul style="list-style-type: none"> ▪ Closely spaced linear group. ▪ Birch trees growing from managed hedge row with dense lower stem ivy cover; no signs indicating possible underlying issues. ▪ Previous crown lift pruning to a height of 4m. 	<ul style="list-style-type: none"> ▪ Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme 	P = Secondary branches to approximately 60mm diameter. T = Person using public park.	2	4	6	N/A	<1M	N/A

Site:	Rachel Taylor Memorial Playing Field, Aughton, Lancashire, L39 5DE
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T13	Common Ash	SM	8	510	5	G	<ul style="list-style-type: none"> Recently heavily reduced to 6.5m apex, with resultant regrowth. Canopy exhibits good vitality, with no current signs of colonisation by ADD. Informed by client's representative, Irene Roberts, that a neighbouring resident has expressed concern regarding the safety of this tree. It was evident at the time of inspection that the tree is in a good physiological and structural condition, with no discernible significant risk features. 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Tertiary branch shoots of approximately 70mm diameter. T = Persons using public park.	2	4	6	N/A	<1M	N/A
T14	Common Ash	SM	14	570	9	M	<ul style="list-style-type: none"> Basal bark damage subsequent of ground maintenance machinery. Stem bifurcates at a height of 2.5m. Numerous pruning wounds from previous crown lifting to a height of 4m, including removal of a primary branch to a diameter of approximately 260mm. Signs of early decline indicative of ADD, with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Secondary branch to a diameter of approximately 100mm. T = Persons using public park.	2	4	5	N/A	<1M	N/A
G6	4no. Wild Cherry, 2no. Rowan	SM	≤ 8	≤ 350	≤ 6	M-G	<ul style="list-style-type: none"> Moderately spaced linear group. Numerous instances of basal bark damage and surface root damage from grounds maintenance machinery. Frequent instances of basal swelling and adaptive growth subsequent of mower damage. Instances of early decay within basal cavities. Mallet sounding does not currently indicate significant internal defects. 	<ul style="list-style-type: none"> Tree consultant to monitor groups structural and physiological condition as part of future cyclical inspections. 	P = Tertiary branches to a diameter of approximately 60mm. T = Persons using public footpath.	2	4	6	N/A	<1M	N/A
G7	Mixed Broadleaf Species	SM-EM	≤ 15	≤ 560	≤ 10	G	<ul style="list-style-type: none"> Previous crown lift pruning. Canopies evidently encroaching beyond residential boundaries by approximately 1m. Informed by client's representative, Irene Roberts, that neighbouring residents have lodged complaints regarding the overhanging canopies. The trees have been recommended to be reduced back to boundary to appease the residents' concerns. However, the works are not subsequent of identified risk, and any further tree works beyond those recommended would be at the Parish Council's discretion. 	<ul style="list-style-type: none"> Tree contractor to reduce overhanging canopies back to boundary, due to ongoing complaints by neighbouring resident (M). 	P = Secondary branches to a diameter of approximately 100mm. T = Persons using public footpath.	2	4	6	N/A	<1M	N/A

Site:	Redsands Park and Play Area, Aughton, Lancashire, L39 4SQ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T15	Sycamore	SM	14	420	9	G	<ul style="list-style-type: none"> Canopy suppressed and biased over residential car park area. Slight stem lean north west, corrects at a height of 5m. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Secondary branching overhanging residential carpark. T = Vehicles parked below.	3	P	6	N/A	<1M	N/A
T16	Common Lime	SM	11	490	7	G	<ul style="list-style-type: none"> Canopy in contact with boundary fencing. Longitudinal lower stem bark wound, approximately 2m x 120mm, with evident wound wood adaptive growth. Historically reduced to 5m apex with regrowth. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Pollard shoots to a diameter of approximately 110mm. T = Persons using children's play area..	2	3	5	N/A	<1M	N/A
T17	Wild Cherry	M	7	500	8	G	<ul style="list-style-type: none"> Exposed surface roots with evident bark damage from grounds maintenance machinery. Stem trifurcates at a height of 2m. Minor instances of deadwood to a diameter of approximately 50mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 50mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
T18	Hybrid Black Poplar	M	18	940	15	G	<ul style="list-style-type: none"> Canopy suppressed and biased east. Minor instances of deadwood to a diameter of approximately 40mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 40mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
G8	5no. Silver Birch	EM-SM	≤ 14	≤ 380	≤ 6	G	<ul style="list-style-type: none"> Close spaced group. Mutual group suppression. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Secondary branch to a diameter of approximately 100mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A

Site:	Redsands Park and Play Area, Aughton, Lancashire, L39 4SQ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
G9	Ash, Sycamore, Silver Birch, Crack Willow, Common Elder	EM-SM	≤ 14	≤ 460#	≤ 7	M-G	<ul style="list-style-type: none"> Close spaced woodland group of mixed broadleaf species. Located on neighbouring land and subsequently not inspected in detail. Ongoing crown reduction management of overhanging canopies. Signs indicative of an early stage of decline subsequent of colonisation by ADD, with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using public park.	2	4	5	N/A	<1M	N/A
G10	2no. Norway Maple, 1no. Hybrid Black Poplar	SM-M	≤ 18	≤ 830	≤ 15	G	<ul style="list-style-type: none"> Close spaced group with subsequent mutual canopy suppression. Minor instances of deadwood to a diameter of approximately 80mm. Canopies significantly overhanging residential boundary by approximately 3m. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Secondary branch to a diameter of approximately 100mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
G11	5no. Hazel, 4no. Green Alder	EM-SM	≤ 11	≤ 490	≤ 6	M-G	<ul style="list-style-type: none"> Closely spaced group. Ivy cover has previously been severed and currently dying back. Dense understorey of Hazel coppice regrowth. Canopies previously reduced and lifted south to facilitate sufficient clearance from residential gardens. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Secondary branches to a diameter of approximately 60mm. T = Persons using neighbouring residential gardens.	2	4	6	N/A	<1M	N/A
G12	Sycamore, Horse Chestnut	SM	≤ 14	≤ 370	≤ 6	M-G	<ul style="list-style-type: none"> Closely spaced group along residential boundaries. Numerous instances of acute included unions, although no current signs of displacement and exhibit settled bark around defect. Previous crown reduction and lift pruning west to facilitate sufficient clearance from residential gardens. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Secondary branches to a diameter of approximately 60mm. T = Persons using neighbouring residential gardens.	2	4	6	N/A	<1M	N/A

Site:	Redsands Park and Play Area, Aughton, Lancashire, L39 4SQ
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within areas specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
G13	Green Alder, Horse Chestnut	EM-SM	≤ 6	≤ 270	≤ 4	P-G	<ul style="list-style-type: none"> Close spaced group along residential boundaries. Ivy severed and dying back throughout area. Previous crown reduction pruning to a height of 3-4m throughout group. Instances of a significant reduction in vitality subsequent of poor management. Limited risk to occupied areas of public park and residential gardens. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 50mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
G14	Common Alder, Green Alder, Sycamore, Horse Chestnut, Common Elder	EM-SM	≤ 15	≤ 460	≤ 8	D-G	<ul style="list-style-type: none"> Close spaced group along residential boundaries. Ivy severed and dying back throughout group. Recent tree removals and canopy pruning subsequent of previous tree survey recommendations. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of group as part of cyclical inspection programme. 	P = Secondary branching to a diameter of approximately 60mm. T = Persons using neighbouring residential gardens.	2	4	6	N/A	<1M	N/A

Site:	The Common & The Precinct, off Delph Common, Aughton, Lancashire, L39 5DW
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T19	Common Ash	M	14	680	13	M	<ul style="list-style-type: none"> Signs indicative of an early to moderate stage of decline subsequent of colonisation by ADD, with remaining canopy falling into Class 1 (see para. 3.7 of report). 	<ul style="list-style-type: none"> Tree consultant to monitor Ash for progression of ADD as component of future cyclical inspections. 	P = Deadwood to a diameter of approximately 100mm. T = Persons using public park.	2	4	5	N/A	<1M	N/A
T20	Rowan	SM	6	300	3	D	<ul style="list-style-type: none"> Helical bark fracture through lower stem. Instances of basal bark necrosis. Signs of a significant reduction in vitality and moderate stage of progressive decline. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 70mm. T = Persons using public park.	2	4	3	N/A	500 K	N/A
T21	Wild Cherry	M	10	620	9	G	<ul style="list-style-type: none"> Several fungal fruiting bodies of white rot decay causing <i>Ganoderma</i> sp. around stem base to a diameter of approximately 60mm. Nylon mallet sounding does not indicate significant internal decay. Exposed surface roots. Surface root bark damage subsequent of grounds maintenance machinery. Minor instances of deadwood to a diameter of approximately 60mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using public park.	2	4	6	N/A	<1M	N/A
T22	Common Hawthorn	SM	5	200	3	D	<ul style="list-style-type: none"> Tree is dead. 	<ul style="list-style-type: none"> Tree contractor to remove tree due to identified increased risk of failure and subsequent risk of harm to persons. 	P = Deadwood to a diameter of approximately 70mm. T = Persons using public park.	2	4	2	50%	100 K	M
T23	Sycamore	M	15	820	8	G	<ul style="list-style-type: none"> Stem trifurcates at a height of 2.5m into acute included unions with no signs of displacement and exhibit settled bark around junctions. Canopy overhanging residential garden to a height of approximately 2.5m. Minor instances of deadwood to a diameter of approximately 60mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 60mm. T = Persons using neighbouring residential garden.	2	4	6	N/A	<1M	N/A

Site:	The Common & The Precinct, off Delph Common, Aughton, Lancashire, L39 5DW
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	18 October 2023
Viewing Conditions:	Overcast with moderate wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
G15	2no. Weeping Willow	SM	≤ 11	≤ 470	≤ 9	G	<ul style="list-style-type: none"> Moderate spaced group. Slight stem leans south. Canopies overhanging public footpath to a height of <1m. Signs of early displacement and cracking of public footpath hardstanding. Minor instances of deadwood to a diameter of approximately 40mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of trees as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 40mm. T = Persons using public footpath.	2	4	6	N/A	<1M	N/A
G16	2no. Common Hawthorn	SM	≤ 6	≤ 300	≤ 5	M	<ul style="list-style-type: none"> Moderately spaced group. Slight stem leans south, correcting at a height of 2m. Canopies exhibit signs of a significant reduction in vitality and state of progressive decline. Minor instances of deadwood to a diameter of approximately 40mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of trees as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 40mm. T = Persons using public footpath.	2	4	6	N/A	<1M	N/A
G17	2no. Swedish Whitebeam	SM	≤ 9	≤ 540	≤ 8	G	<ul style="list-style-type: none"> Moderately spaced group. Previous crown lift pruning to a height of 4m. Northern tree has previously been reduced to facilitate sufficient clearance from neighbouring residential building. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of trees as part of cyclical inspection programme. 	P = Deadwood to a diameter of approximately 70mm. T = Persons using public park.	2	4	6	50%	<1M	N/A

Site:	Delph Quarry Woodland, Delph Lane, Aughton, Lancashire, L39 5EB
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	23 September 2022
Viewing Conditions:	Clear, no discernible wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T24	Common Beech	PM	16	1300	15	M	<ul style="list-style-type: none"> Extensive colonisation of <i>Ganoderma</i> sp. (white rot decay causing fungi) throughout base and lower stem. Stem bifurcates at a height of approximately 2.5m. Recent failure of primary branch at a height of 4m, to a diameter of approximately 470mm, with arisings evidently having been processed on site. Neighbouring tree has been heavily reduced subsequent of damage from aforementioned branch failure. Tree is evidently in a significant stage of decline, with further projected significant failures over woodland desire lines. Informed by client's representative, Irene Roberts, that this tree has been highlighted as a significant concern due to previous large branch failures and subsequent complaints from persons using the woodland area. 	<ul style="list-style-type: none"> Tree contractor to remove tree due to evident state of decline. NB: Main stem and lower primary branches may be retained at suitable height as standing deadwood of habitat value. 	<p>P = Primary branching to a diameter of approximately 450mm.</p> <p>T = Persons using woodland footpath.</p>	2	1	2	N/A	200	H
T25	Common Beech	M	20	1040	15	M	<ul style="list-style-type: none"> Significant stem lean east, which partially corrects at a height of approximately 7m, and canopy highly biased to east. Rooting area appears settled with no signs of ground disturbance. Longitudinal stem cavity from base to a height of 2m, approximately 200mm wide, exposing internal hollowing with solid residual walls and substantial adaptive growth. Stem bifurcates at a height of approximately 5m. Several instances of historic secondary branch union failures. Tree leans over an open site with signs of increased occupancy; rudimentary seats from on-site arisings and fire pit area. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree annually as part of cyclical inspection programme. 	<p>P = Secondary branching to a diameter of approximately 240mm.</p> <p>T = Persons using woodland footpath.</p>	2	3	5	N/A	<1M	M

Site:	Delph Quarry Woodland, Delph Lane, Aughton, Lancashire, L39 5EB
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	23 September 2022
Viewing Conditions:	Clear, no discernible wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T26	Common Beech	M	19	1060	16	M	<ul style="list-style-type: none"> Stem bifurcates at a height of approximately 5m, with signs of possible union displacement along holding wood. Water holding cavity, to a diameter of approximately 200mm, at a height of 7m. Evident colonisation of <i>Ganoderma</i> sp. (white rot decay causing fungi) with ten fruiting bodies, to a diameter of approximately 90mm, present from a height of 4-6m Frequent instances of socket cavities, to a diameter of approximately 70mm, from lower canopy tertiary branch shedding. Minor instances of deadwood to a diameter of approximately 60mm. Rope swings attached to primary branch above fungal brackets; primary union projected to be structurally compromised subsequent of progressive decay. Numerous desire lines and signs of high use below canopy. Informed by client's representative, Irene Roberts, that this tree has been highlighted as a significant concern due to rope swings frequently attached to primary branches above fungal fruiting brackets. Despite the client removing the rope swings, when possible, new ropes are evidently attached shortly after. 	<ul style="list-style-type: none"> Tree contractor to remove tree due to compromise of structural integrity and evident signs of high use below canopy. NB: Main stem may be retained at a suitable height as standing deadwood of habitat value. 	<p>P = Primary branching to a diameter of >450mm. T = Persons using public woodland.</p>	2	1	2	N/A	200	H
T27	Sycamore	M	15	560	10	M	<ul style="list-style-type: none"> Located adjacent to vehicle track boundary. Longitudinal lower stem fracture, approximately 2m x 120mm, exposing internal hollowing with solid internal walls. Evident compensatory wound wood adaptive growth around stem defect. Stem defect appears resultant of historic shear fracture, indicated by adjacent compensatory 'rib' growths from base to a height of 3m. Minor instances of deadwood to a diameter of approximately 70mm. 	<ul style="list-style-type: none"> Tree consultant to monitor structural and physiological condition of tree annually as part of cyclical inspection programme. 	<p>P = Full stem at ground level. T = Vehicles using access track.</p>	3	1	6	N/A	<1M	N/A

Site:	Delph Quarry Woodland, Delph Lane, Aughton, Lancashire, L39 5EB
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill <small>FdSc MA ArborA</small>
Survey Date:	23 September 2022
Viewing Conditions:	Clear, no discernible wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
T28	Scots Pine	M	20	850	16	G	<ul style="list-style-type: none"> ▪ Slight stem lean east. ▪ Moderate instances of deadwood to a diameter of approximately 120mm over vehicle access track. ▪ Informed by client's representative, Irene Roberts, that neighbouring resident has expressed concerns regarding the safety of this tree. The tree evidently exhibits a good physiological and structural condition with settled bark patterns throughout lower stem, indicating acclimatisation to lower stem lean. 	<ul style="list-style-type: none"> ▪ Tree contractor to remove deadwood >35mm diameter over vehicle track (See Comments), due to identified increased risk of failure and subsequent risk of harm to persons. 	P = Deadwood to a diameter of approximately 120mm. T = Persons using woodland footpath.	3	3	2	N/A	50K	M





Site:	Delph Quarry Woodland, Delph Lane, Aughton, Lancashire, L39 5EB
Client:	Aughton Parish Council
Brief:	Carry out a walkover tree survey within area specified by agent, report on projected risk posed to persons and property, and make management recommendations where appropriate

Surveyor:	Ryan Gledhill FdSc MArborA
Survey Date:	23 September 2022
Viewing Conditions:	Clear, no discernible wind
Job Reference:	BTC2558

No.	Species	Age	Height (m)	Stem Diam. (mm)	Crown Spread (m)	Vitality	Comments	Management Recommendations	Risk Assessment Description (Part/Target)	Target	Size	P.O.F	Reduced Mass %	Risk Index	Work Priority
W1	Beech, Sycamore, Common Oak, Silver Birch, Aspen, Scots Pine, Hawthorn, Common Elder	EM-M	≤ 20	≤ 1200	≤ 14	P-G	<ul style="list-style-type: none"> Closely to moderately spaced woodland group. Trees growing from historic quarry site. Several desire lines and partially constructed bicycle tracks throughout woodland. Frequent instances of significant deadwood and standing dead stems; risk features located in low occupancy areas within woodland and should be retained for ecological benefits. Numerous examples of veteran features to mature trees, providing important wildlife habitats and ecological benefits throughout woodland. Recent remedial tree works completed, subsequent of 2022 tree inspection recommendations. Informed by client's representative, Irene Roberts, during an on-site meeting at Delph Quarry Woodland; Aughton Parish Council are concerned about the overall form of the tree stock, several clearings within the site and the public's use of the area. Client was advised that due to the natural establishment of the trees, the woodland has acclimatised to exhibit an optimised shared canopy form. In turn, this facilitates the mass dampening abilities of the tree stands, and whilst many individual trees may exhibit a slender form and appear to significantly sway in the wind, this oscillating movement works to reduce loading and increase the mechanical stability of the branch architecture. It was also discussed that the natural openings within the woodland should be retained as sun traps to enjoy the surrounding area, rather than utilised for new tree planting. In turn, it is recommended that the establishment of silvicultural management would not be projected to improve the aesthetics or longevity of the woodland, and would not be appropriate at this site. However, due to the dynamic nature of trees and the evident moderate to high use areas within the woodland, it has been recommended that the woodland is re-inspected annually. 	<ul style="list-style-type: none"> Tree contractor to remove deadwood >35mm diameter over desire lines and high use areas, due to identified increased risk of failure and subsequent risk of harm to persons. Tree consultant to re-inspect structural and physiological condition of woodland annually as part of cyclical inspection programme (See Comments). 	<p>P = Deadwood to a diameter of approximately 200mm. T = Persons occupying public woodland.</p>	2	3	3	N/A	50K	M



T = Individual Tree

-  (Red) = Tree with Risk of Harm of 1/1,000 or greater
-  (Orange) = Tree with Risk of Harm between 1/1,000 and 1/10,000
-  (Yellow) = Tree with Risk of Harm between 1/10,000 and 1/1,000,000
-  (Green) = Tree with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

**Site: Granville Park War Memorial,
Aughton, L39 5DS**

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

Date: October 2023

**TREE SURVEY
PLAN**

(Granville Park War Memorial - Site 1)

Bowland 
Tree Consultancy Ltd

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



T = Individual Tree, G = Group of Trees

- (Red) = Tree/Group with Risk of Harm of 1/1,000 or greater
- (Orange) = Tree/Group with Risk of Harm between 1/1,000 and 1/10,000
- (Yellow) = Tree/Group with Risk of Harm between 1/10,000 and 1/1,000,000
- (Green) = Tree/Group with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

**Site: William Arnold Silcock Memorial
Playing Field, Winifred Lane, Aughton,
L39 5DJ**

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

Date: October 2023

TREE SURVEY PLAN

(William Arnold Silcock Memorial
Playing Field - Site 2)

Bowland 
Tree Consultancy Ltd

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



T = Individual Tree, G = Group of Trees

- (Red) = Tree/Group with Risk of Harm of 1/1,000 or greater
- (Orange) = Tree/Group with Risk of Harm between 1/1,000 and 1/10,000
- (Yellow) = Tree/Group with Risk of Harm between 1/10,000 and 1/1,000,000
- (Green) = Tree/Group with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

Site: Rachel Taylor Memorial Playing Field and Play area, off Delph Park Avenue, Aughton, L39 5DE

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

Date: October 2023

TREE SURVEY PLAN

(Rachel Taylor Memorial Playing Field - Site 3)

Bowland 
Tree Consultancy Ltd

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



T = Individual Tree, G = Group of Trees

- (Red) = Tree/Group with Risk of Harm of 1/1,000 or greater
- (Orange) = Tree/Group with Risk of Harm between 1/1,000 and 1/10,000
- (Yellow) = Tree/Group with Risk of Harm between 1/10,000 and 1/1,000,000
- (Green) = Tree/Group with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

**Site: Redsands Park and Play area, off
Prescot Road, Aughton, L39 4SQ**

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

Date: October 2023

TREE SURVEY PLAN

(Redsands Park and Play area - Site 4)

Bowland 
Tree Consultancy Ltd

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



T = Individual Tree, G = Group of Trees

- (Red) = Tree/Group with Risk of Harm of 1/1,000 or greater
- (Orange) = Tree/Group with Risk of Harm between 1/1,000 and 1/10,000
- (Yellow) = Tree/Group with Risk of Harm between 1/10,000 and 1/1,000,000
- (Green) = Tree/Group with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

Site: The Common & The Precinct, off Delph Common Road, Aughton, L39 5DW

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

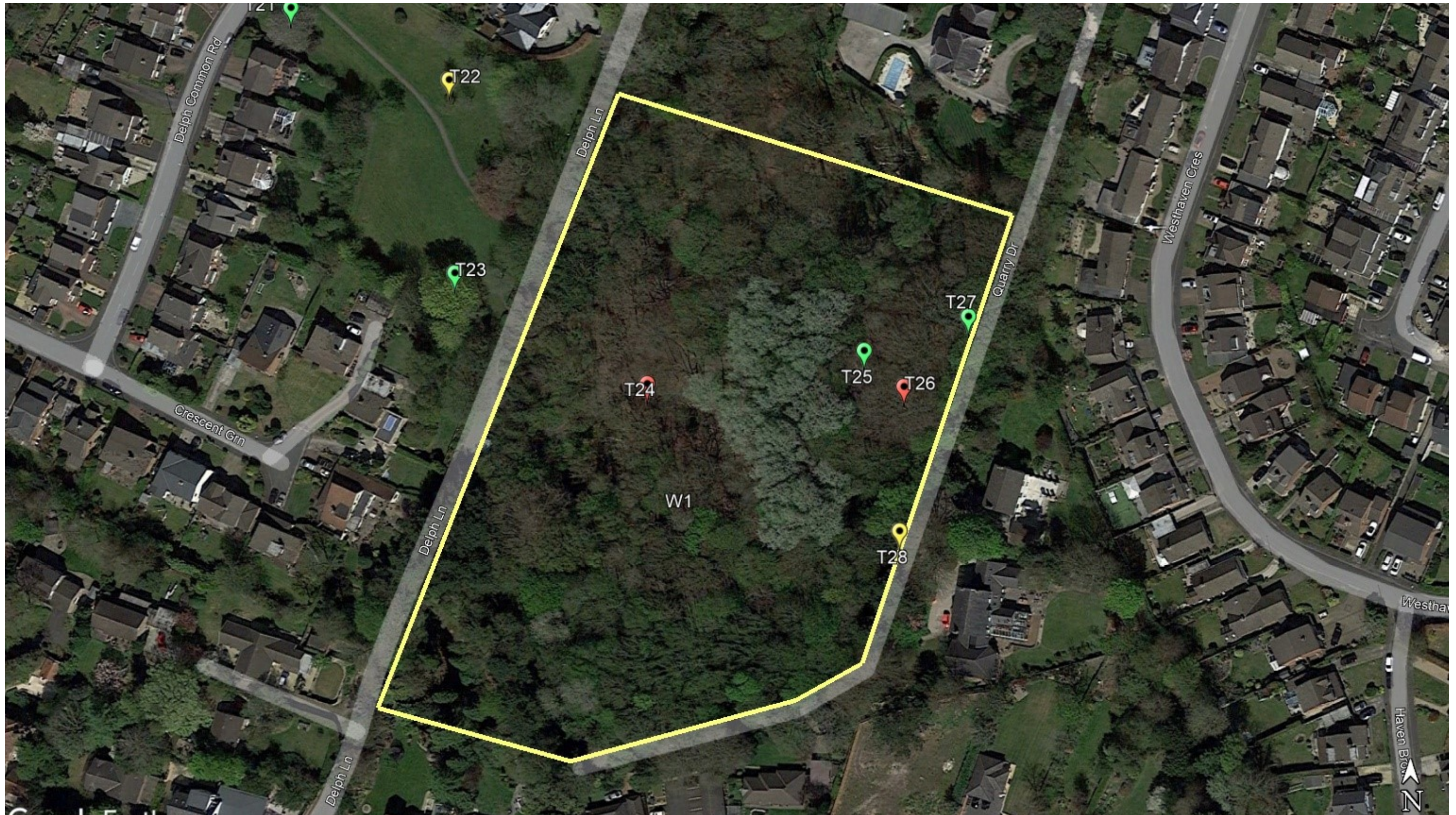
Date: October 2023

TREE SURVEY PLAN

(The Common & The Precinct - Site 5)

Bowland 
Tree Consultancy Ltd

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



T = Individual Tree, G = Group of Trees, W = Woodland

- (Red) = Tree/Group/Woodland with Risk of Harm of 1/1,000 or greater
- (Orange) = Tree/Group/Woodland with Risk of Harm between 1/1,000 and 1/10,000
- (Yellow) = Tree/Group/Woodland with Risk of Harm between 1/10,000 and 1/1,000,000
- (Green) = Tree/Group/Woodland with Risk of Harm less than 1/1,000,000

* See QTRA Methodology Overview and Application in Management Decisions Section of Report for details regarding Risk of Harm

Site: Delph Quarry Woodland ('the Delph'), off Delph Lane, Aughton, L39 5EB

Job No.: BTC2558

Scale: Not to Scale

Paper Size (for printing): A3

Date: October 2023

TREE SURVEY **Bowland** Tree Consultancy Ltd

PLAN

(Delph Quarry Woodland - Site 6)

e: info@bowlandtreeconsultancy.co.uk
t: 01772 437150



Quantified Tree Risk Assessment
Simply Balancing Risks With Benefits



Quantified Tree Risk Assessment
PRACTICE NOTE

VERSION 5

Quantified Tree Risk Assessment Practice Note

"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind"

William Thomson, Lord Kelvin, Popular Lectures and Addresses [1891-1894]

1. INTRODUCTION

Every day we encounter risks in all of our activities, and the way we manage those risks is to make choices. We weigh up the costs and benefits of the risk to determine whether it is acceptable, unacceptable, or tolerable. For example, if you want to travel by car you must accept that even with all the extensive risk control measures, such as seat-belts, speed limits, airbags, and crash barriers, there is still a significant risk of death. This is an everyday risk that is taken for granted and tolerated by millions of people in return for the benefits of convenient travel. Managing trees should take a similarly balanced approach.

A risk from falling trees exists only if there is both potential for tree failure and potential for harm to result. The job of the risk assessor is to consider the likelihood and consequences of tree failure. The outcome of this assessment can then inform consideration of the risk by the tree manager, who may also be the owner.

Using a comprehensive range of values¹, Quantified Tree Risk Assessment (QTRA) enables the tree assessor to identify and analyse the risk from tree failure in three key stages. 1) to consider land-use in terms of vulnerability to impact and likelihood of occupation, 2) to consider the consequences of an impact, taking account of the size of the tree or branch concerned, and 3) to estimate the probability that the tree or branch will fail onto the land-use in question. Estimating the values of these components, the assessor can use the QTRA manual calculator or software application to calculate an annual Risk of Harm from a particular tree. To inform management decisions, the risks from different hazards can then be both ranked and compared, and considered against broadly acceptable and tolerable levels of risk.

A Proportionate Approach to Risks from Trees

The risks from falling trees are usually very low and high risks will usually be encountered only in areas with either high levels of human occupation or with valuable property. Where levels of human occupation and value of property are sufficiently low, the

assessment of trees for structural weakness will not usually be necessary. Even when land-use indicates that the assessment of trees is appropriate, it is seldom proportionate to assess and evaluate the risk for each individual tree in a population. Often, all that is required is a brief consideration of the trees to identify gross signs of structural weakness or declining health. Doing all that is reasonably practicable does not mean that all trees have to be individually examined on a regular basis (HSE 2013).

The QTRA method enables a range of approaches from the broad assessment of large collections of trees to, where necessary, the detailed assessment of an individual tree.

Risk of Harm

The QTRA output is termed the Risk of Harm and is a combined measure of the likelihood and consequences of tree failure, considered against the baseline of a lost human life within the coming year.

ALARP (As Low As Reasonably Practicable)

Determining that risks have been reduced to As Low As Reasonably Practicable (HSE 2001) involves an evaluation of both the risk and the sacrifice or cost involved in reducing that risk. If it can be demonstrated that there is gross disproportion between them, the risk being insignificant in relation to the sacrifice or cost, then to reduce the risk further is not 'reasonably practicable'.

Costs and Benefits of Risk Control

Trees confer many benefits to people and the wider environment. When managing any risk, it is essential to maintain a balance between the costs and benefits of risk reduction, which should be considered in the determination of ALARP. It is not only the financial cost of controlling the risk that should be considered, but also the loss of tree-related benefits, and the risk to workers and the public from the risk control measure itself.

When considering risks from falling trees, the cost of risk control will usually be too high when it is clearly 'disproportionate' to the reduction in risk. In the

¹ See Tables 1, 2 & 3.

context of QTRA, the issue of ‘gross disproportion’², where decisions are heavily biased in favour of safety, is only likely to be considered where there are risks of 1/10 000 or greater.

Acceptable and Tolerable Risks

The Tolerability of Risk framework (ToR) (HSE 2001) is a widely accepted approach to reaching decisions on whether risks are broadly acceptable, unacceptable, or tolerable. Graphically represented in Figure 1, ToR can be summarised as having a Broadly Acceptable Region where the upper limit is an annual risk of death 1/1 000 000, an Unacceptable Region for which the lower limit is 1/1 000, and between these a Tolerable Region within which the tolerability of a risk will be dependent upon the costs and benefits of risk reduction. In the Tolerable Region, we must ask whether the benefits of risk control are sufficient to justify their cost.

In respect of trees, some risks cross the Broadly Acceptable 1/1 000 000 boundary, but remain tolerable. This is because any further reduction would involve a disproportionate cost in terms of the lost environmental, visual, and other benefits, in addition to the financial cost of controlling the risk.

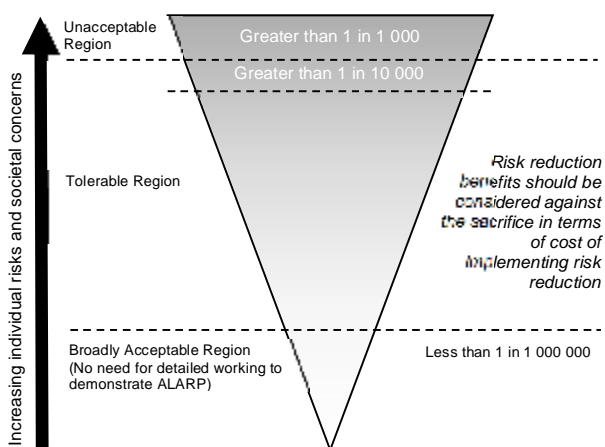


Figure 1. Adapted from the Tolerability of Risk framework (HSE 2001).

Value of Statistical Life

The Value of Statistical Life (VOSL), is a widely applied risk management device, which uses the value of a hypothetical life to guide the proportionate allocation of resources to risk reduction. In the UK, this value is currently in the region of £2 000 000, and this is the value adopted in the QTRA method.

In QTRA, placing a statistical value on a human life has two particular uses. Firstly, QTRA uses VOSL to

enable damage to property to be compared with the loss of life, allowing the comparison of risks to people and property. Secondly, the proportionate allocation of financial resources to risk reduction can be informed by VOSL. “A value of statistical life of £1 000 000 is just another way of saying that a reduction in risk of death of 1/100 000 per year has a value of £10 per year” (HSE 1996).

Internationally, there is variation in VOSL, but to provide consistency in QTRA outputs, it is suggested that VOSL of £2 000 000 should be applied internationally. This is ultimately a decision for the tree manager.

2. OWNERSHIP OF RISK

Where many people are exposed to a risk, it is shared between them. Where only one person is exposed, that individual is the recipient of all of the risk and if they have control over it, they are also the owner of the risk. An individual may choose to accept or reject any particular risk to themselves, when that risk is under their control. When risks that are imposed upon others become elevated, societal concern will usually require risk controls, which ultimately are imposed by the courts or government regulators.

Although QTRA outputs might occasionally relate to an individual recipient, this is seldom the case. More often, calculation of the Risk of Harm is based on a cumulative occupation – i.e. the number of people per hour or vehicles per day, without attempting to identify the individuals who share the risk.

Where the risk of harm relates to a specific individual or a known group of people, the risk manager might consider the views of those who are exposed to the risk when making management decisions. Where a risk is imposed on the wider community, the principles set out in the ToR framework can be used as a reasonable approach to determine whether the risk is ALARP.

3. THE QTRA METHOD - VERSION 5

The input values for the three components of the QTRA calculation are set out in broad ranges³ of Target, Size, and Probability of Failure. The assessor estimates values for these three components and inputs them on either the manual calculator or software application to calculate the Risk of Harm.

² Discussed further on page 5.

³ See Tables 1, 2 & 3.

Assessing Land-use (Targets)

The nature of the land-use beneath or adjacent to a tree will usually inform the level and extent of risk assessment to be carried out. In the assessment of Targets, six ranges of value are available. Table 2 sets out these ranges for vehicular frequency, human occupation and the monetary value of damage to property.

Human Occupation

The probability of pedestrian occupation at a particular location is calculated on the basis that an average pedestrian will spend five seconds walking beneath an average tree. For example, an average occupation of ten pedestrians per day, each occupying the Target for five seconds is a daily occupation of fifty seconds, giving a likelihood of occupation 1/1,728. Where a longer occupation is likely, as with a habitable building, outdoor café, or park bench, the period of occupation can be measured, or estimated as a proportion of a given unit of time, e.g. six hours per day (1/4). The Target is recorded as a range (Table 2).

Weather Affected Targets

Often the nature of a structural weakness in a tree is such that the probability of failure is greatest during windy weather, while the probability of the site being occupied by people during such weather is often low. This applies particularly to outdoor recreational areas. When estimating human Targets, the risk assessor must answer the question 'in the weather conditions that I expect the likelihood of failure of the tree to be initiated, what is my estimate of human occupation?' Taking this approach, rather than using the average occupation, ensures that the assessor considers the relationship between weather, people, and trees, along with the nature of the average person with their ability to recognise and avoid unnecessary risks.

Vehicles on the Highway

In the case of vehicles, likelihood of occupation may relate to either the falling tree or branch striking the vehicle or the vehicle striking the fallen tree. Both types of impact are influenced by vehicle speed; the faster the vehicle travels the less likely it is to be struck by the falling tree, but the more likely it is to strike a fallen tree. The probability of a vehicle occupying any particular point in the road is the ratio of the time it is occupied - including a safe stopping distance - to the total time. The average vehicle on a UK road is occupied by 1.6 people (DfT 2010). To account for the substantial protection that the average vehicle provides against most tree impacts and in particular, frontal collisions, QTRA values the substantially

protected 1.6 occupants in addition to the value of the vehicle as equivalent to one exposed human life.

Property

Table 1. Size

Size Range	Size of tree or branch	Range of Probability
1	> 450mm (>18") dia.	1/1 - >1/2
2	260mm (10 ¹ / ₂ ") dia. - 450mm (18") dia.	1/2 - >1/8.6
3	110mm (4 ¹ / ₂ ") dia. - 250mm (10") dia.	1/8.6 - >1/82
4	25mm (1") dia. - 100mm (4") dia.	1/82 - 1/2 500

* Range 1 is based on a diameter of 600mm.

Property can be anything that could be damaged by a falling tree, from a dwelling, to livestock, parked car, or fence. When evaluating the exposure of property to tree failure, the QTRA assessment considers the cost of repair or replacement that might result from failure of the tree. Ranges of value are presented in Table 2 and the assessor's estimate need only be sufficient to determine which of the six ranges the cost to select.

In Table 2, the ranges of property value are based on a VOSL of £2 000 000, e.g. where a building with a replacement cost of £20 000 would be valued at 0.01 (1/100) of a life (Target Range 2).

When assessing risks in relation to buildings, the Target to be considered might be the building, the occupants, or both. Occupants of a building could be protected from harm by the structure or substantially exposed to the impact from a falling tree if the structure is not sufficiently robust, and this will determine how the assessor categorises the Target.

Multiple Targets

A Target might be constantly occupied by more than one person and QTRA can account for this. For example, if it is projected that the average occupation will be constant by 10 people, the Risk of Harm is calculated in relation to one person constantly occupying the Target before going on to identify that the average occupation is 10 people. This is expressed as Target 1(10T)/1, where 10T represents the Multiple Targets. In respect of property, a Risk of Harm 1(10T)/1 would be equivalent to a risk of losing £20 000 000 as opposed to £2 000 000.

Tree or Branch Size

A small dead branch of less than 25mm diameter is not likely to cause significant harm even in the case of direct contact with a Target, while a falling branch with a diameter greater than 450mm is likely to cause some harm in the event of contact with all but the most robust Target. The QTRA method categorises

Size by the diameter of tree stems and branches (measured beyond any basal taper). An equation derived from weight measurements of trees of different stem diameters is used to produce a data set of comparative weights of trees and branches ranging from 25mm to 600mm diameter, from which Table 1 is compiled. The size of dead branches might be

discounted where they have undergone a significant reduction in weight because of degradation and shedding of subordinate branches. This discounting, referred to as 'Reduced Mass', reflects an estimated reduction in the mass of a dead branch.

Table 2. Targets

Target Range	Property (repair or replacement cost)	Human (not in vehicles)	Vehicle Traffic (number per day)	Ranges of Value (probability of occupation or fraction of £2 000 000)
1	£2 000 000 – >£200 000	Occupation: Constant – 2.5 hours/day Pedestrians 720/hour – 73/hour & cyclists:	26 000 – 2 700 @ 110kph (68mph) 32 000 – 3 300 @ 80kph (50mph) 47 000 – 4 800 @ 50kph (32mph)	1/1 – >1/10
2	£200 000 – >£20 000	Occupation: 2.4 hours/day – 15 min/day Pedestrians 72/hour – 8/hour & cyclists:	2 600 – 270 @ 110kph (68mph) 3 200 – 330 @ 80kph (50mph) 4 700 – 480 @ 50kph (32mph)	1/10 – >1/100
3	£20 000 – >£2 000	Occupation: 14 min/day – 2 min/day Pedestrians 7/hour – 2/hour & cyclists:	260 – 27 @ 110kph (68mph) 320 – 33 @ 80kph (50mph) 470 – 48 @ 50kph (32mph)	1/100 – >1/1 000
4	£2 000 – >£200	Occupation: 1 min/day – 2 min/week Pedestrians 1/hour – 3/day & cyclists:	26 – 4 @ 110kph (68mph) 32 – 4 @ 80kph (50mph) 47 – 6 @ 50kph (32mph)	1/1 000 – >1/10 000
5	£200 – >£20	Occupation: 1 min/week – 1 min/month Pedestrians 2/day – 2/week & cyclists:	3 – 1 @ 110kph (68mph) 3 – 1 @ 80kph (50mph) 5 – 1 @ 50kph (32mph)	1/10 000 – >1/100 000
6	£20 – £2	Occupation: <1 min/month – 0.5 min/year Pedestrians 1/week – 6/year & cyclists:	None	1/100 000 – 1/1 000 000

Vehicle, pedestrian and property Targets are categorised by their frequency of use or their monetary value. The probability of a vehicle or pedestrian occupying a Target area in Target Range 4 is between the upper and lower limits of 1/1 000 and >1/10 000 (column 5). Using the VOSL £2 000 000, the property repair or replacement value for Target Range 4 is £2 000 - >200.

Probability of Failure

In the QTRA assessment, the probability of tree or branch failure within the coming year is estimated and recorded as a range of value (Ranges 1 – 7, Table 3).

Selecting a Probability of Failure (PoF) Range requires the assessor to compare their assessment of the tree or branch against a benchmark of either a non-compromised tree at Probability of Failure Range 7, or a tree or branch that we expect to fail within the year, which can be described as having a 1/1 probability of failure.

During QTRA training, Registered Users go through a number of field exercises in order to calibrate their estimates of Probability of Failure.

Table 3. Probability of Failure

Probability of Failure Range	Probability
1	1/1 - >1/10
2	1/10 - >1/100
3	1/100 - >1/1 000
4	1/1 000 - >1/10 000
5	1/10 000 - >1/100 000
6	1/100 000 - >1/1 000 000
7	1/1 000 000 - 1/10 000 000

The probability that the tree or branch will fail within the coming year.

The QTRA Calculation

The assessor selects a Range of values for each of the three input components of Target, Size and Probability of Failure. The Ranges are entered on either the manual calculator or software application to calculate a Risk of Harm.

The Risk of Harm is expressed as a probability and is rounded, to one significant figure. Any Risk of Harm

that is lower than 1/1 000 000 is represented as <1/1 000 000. As a visual aid, the Risk of Harm is colour coded using the traffic light system illustrated in Table 4 (page 7).

Risk of Harm - Monte Carlo Simulations

The Risk of Harm for all combinations of Target, Size and Probability of Failure Ranges has been calculated using Monte Carlo simulations⁴. The QTRA Risk of Harm is the mean value from each set of Monte Carlo results.

In QTRA Version 5, the Risk of Harm should not be calculated without the manual calculator or software application.

Assessing Groups and Populations of Trees

When assessing populations or groups of trees, the highest risk in the group is quantified and if that risk is tolerable, it follows that risks from the remaining trees will also be tolerable, and further calculations are unnecessary. Where the risk is intolerable, the next highest risk will be quantified, and so on until a tolerable risk is established. This process requires prior knowledge of the tree manager's risk tolerance.

Accuracy of Outputs

The purpose of QTRA is not necessarily to provide high degrees of accuracy, but to provide for the quantification of risks from falling trees in a way that risks are categorised within broad ranges (Table 4).

4. INFORMING MANAGEMENT DECISIONS

Balancing Costs and Benefits of Risk Control

When controlling risks from falling trees, the benefit of reduced risk is obvious, but the costs of risk control are all too often neglected. For every risk reduced there will be costs, and the most obvious of these is the financial cost of implementing the control measure. Frequently overlooked is the transfer of risks to workers and the public who might be directly affected by the removal or pruning of trees. Perhaps more importantly, most trees confer benefits, the loss of which should be considered as a cost when balancing the costs and benefits of risk control.

When balancing risk management decisions using QTRA, consideration of the benefits from trees will usually be of a very general nature and not require detailed consideration. The tree manager can consider, in simple terms, whether the overall cost of risk control is a proportionate one. Where risks are

approaching 1/10 000, this may be a straightforward balancing of cost and benefits. Where risks are 1/10 000 or greater, it will usually be appropriate to implement risk controls unless the costs are grossly disproportionate to the benefits rather than simply disproportionate. In other words, the balance being weighted more on the side of risk control with higher associated costs.

Considering the Value of Trees

It is necessary to consider the benefits provided by trees, but they cannot easily be monetised and it is often difficult to place a value on those attributes such as habitat, shading and visual amenity that might be lost to risk control.

A simple approach to considering the value of a tree asset is suggested here, using the concept of 'average benefits'. When considered against other similar trees, a tree providing 'average benefits' will usually present a range of benefits that are typical for the species, age and situation. Viewed in this way, a tree providing 'average benefits' might appear to be low when compared with particularly important trees – such as in Figure 2, but should nonetheless be sufficient to offset a Risk of Harm of less than 1/10 000. Without having to consider the benefits of risk controls, we might reasonably assume that below 1/10 000, the risk from a tree that provides 'average benefits' is ALARP.

In contrast, if it can be said that the tree provides lower than average benefits because, for example, it is declining and in poor physiological condition, it may be necessary to consider two further elements. Firstly, is the Risk of Harm in the upper part of the Tolerable Region, and secondly, is the Risk of Harm likely to increase before the next review because of an increased Probability of Failure. If both these conditions apply then it might be appropriate to consider the balance of costs and benefits of risk reduction in order to determine whether the risk is ALARP. This balance requires the tree manager to take a view of both the reduction in risk and the costs of that reduction.

⁴ For further information on the Monte Carlo simulation method, refer to http://en.wikipedia.org/wiki/Monte_Carlo_method



Fig. 2

Lower Than Average Benefits from Trees

Usually, the benefits provided by a tree will only be significantly reduced below the 'average benefits' that are typical for the species, age and situation, if the life of the benefits is likely to be shortened, perhaps because the tree is declining or dead. That is not to say that a disbenefit, such as undesirable shading, lifting of a footpath, or restricting the growth of other trees, should not also be considered in the balance of costs and benefits.

The horse chestnut tree in Figure 3 has recently died, and over the next few years, may provide valuable habitats. However, for this tree species and the relatively fast rate at which its wood decays, the lifetime of these benefits is likely to be limited to only a few years. This tree has an already reduced value that will continue to reduce rapidly over the coming five to ten years at the same time as the Risk of Harm is expected to increase. There will be changes in the benefits provided by the tree as it degrades. Visual qualities are likely to reduce while the decaying wood provides habitats for a range of species, for a short while at least. There are no hard and fast measures of these benefits and it is for the tree manager to decide what is locally important and how it might be balanced with the risks.

Where a risk is within the Tolerable Region and the tree confers lower than average benefits, it might be appropriate to consider implementing risk control while taking account of the financial cost. Here, VOSL can be used to inform a decision on whether the cost of risk control is proportionate. Example 3 below puts this evaluation into a tree management context.

There will be occasions when a tree is of such minimal value and the monetary cost of risk reduction so low that it might be reasonable to further reduce an

already relatively low risk. Conversely, a tree might be of such considerable value that an annual risk of death greater than 1/10 000 would be deemed tolerable.

Occasionally, decisions will be made to retain elevated risks because the benefits from the tree are particularly high or important to stakeholders, and in these situations, it might be appropriate to assess and document the benefits in some detail. If detailed assessment of benefits is required, there are several methodologies and sources of information (Forest Research 2010).

Delegating Risk Management Decisions



Fig. 3

Understanding of the costs with which risk reduction is balanced can be informed by the risk assessor's knowledge, experience and on-site observations, but the risk management decisions should be made by the tree manager. That is not to say that the tree manager should review and agree every risk control measure, but when delegating decisions to surveyors and other staff or advisors, tree managers should set out in a policy, statement or contract, the principles and perhaps thresholds to which trees and their associated risks will ordinarily be managed.

Based on the tree manager accepting the principles set out in the QTRA Practice Note and or any other specific instructions, the risk assessor can take account of the cost/benefit balance and for most situations will

be able to determine whether the risk is ALARP when providing management recommendations.

Table 4. QTRA Advisory Risk Thresholds

Thresholds	Description	Action
1/1,000	Unacceptable Risks will not ordinarily be tolerated	<ul style="list-style-type: none"> Control the risk
	Unacceptable (where imposed on others) Risks will not ordinarily be tolerated	<ul style="list-style-type: none"> Control the risk Review the risk
1/10 000	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	<ul style="list-style-type: none"> Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value Review the risk
	Tolerable (where imposed on others) Risks are tolerable if ALARP	<ul style="list-style-type: none"> Assess costs and benefits of risk control Control the risk only where a significant benefit might be achieved at reasonable cost Review the risk
1/1 000 000	Broadly Acceptable Risk is already ALARP	<ul style="list-style-type: none"> No action currently required Review the risk

QTRA Informative Risk Thresholds

The QTRA advisory thresholds in Table 4 are proposed as a reasonable approach to balancing safety from falling trees with the costs of risk reduction. This approach takes account of the widely applied principles of ALARP and ToR, but does not dictate how these principles should be applied. While the thresholds can be the foundation of a robust policy for tree risk management, tree managers should make decisions based on their own situation, values and resources. Importantly, to enable tree assessors to provide appropriate management guidance, it is helpful for them to have some understanding of the tree owner's management preferences prior to assessing the trees.

A Risk of Harm that is less than 1/1 000 000 is Broadly Acceptable and is already ALARP. A Risk of Harm 1/1 000 or greater is unacceptable and will not ordinarily be tolerated. Between these two values, the Risk of Harm is in the Tolerable Region of ToR and will be tolerable if it is ALARP. In the Tolerable Region, management decisions are informed by

consideration of the costs and benefits of risk control, including the nature and extent of those benefits provided by trees, which would be lost to risk control measures.

For the purpose of managing risks from falling trees, the Tolerable Region can be further broken down into two sections. From 1/1 000 000 to less than 1/10 000, the Risk of Harm will usually be tolerable providing that the tree confers 'average benefits' as discussed above. As the Risk of Harm approaches 1/10 000 it will be necessary for the tree manager to consider in more detail the benefits provided by the tree and the overall cost of mitigating the risk.

A Risk of Harm in the Tolerable Region but 1/10 000 or greater will not usually be tolerable where it is imposed on others, such as the public, and if retained, will require a more detailed consideration of ALARP. In exceptional circumstances a tree owner might choose to retain a Risk of Harm that is 1/10 000 or greater. Such a decision might be based on the agreement of those who are exposed to the risk, or perhaps that the tree is of great importance. In these circumstances, the prudent tree manager will consult with the appropriate stakeholders whenever possible.

5. EXAMPLE QTRA CALCULATIONS AND RISK MANAGEMENT DECISIONS

Below are three examples of QTRA calculations and application of the QTRA Advisory Thresholds.

Example 1.

	Target		Size		Probability of Failure		Risk of Harm
Range	6	x	1	x	3	=	<1/1 000 000

Example 1 is the assessment of a large (Size 1), unstable tree with a probability of failure of between 1/100 and >1/1 000 (PoF 3). The Target is a footpath with less than one pedestrian passing the tree each week (Target 6). The Risk of Harm is calculated as less than 1/1 000 000 (green). This is an example of where the Target is so low consideration of the structural condition of even a large tree would not usually be necessary.

Example 2.

	Target		Size		Probability of Failure		Risk of Harm
Range	1	x	4	x	3	=	1(2T)/50 000

In Example 2, a recently dead branch (Size 4) overhangs a busy urban high street that is on average occupied constantly by two people, and here Multiple Target occupation is considered.

Having an average occupancy of two people, the Risk of Harm 1(2T)/50 000 (yellow) represents a twofold increase in the magnitude of the consequence and is therefore equivalent to a Risk of Harm 1/20 000 (yellow). This risk does not exceed 1/10 000, but being a dead branch at the upper end of the Tolerable Region it is appropriate to consider the balance of costs and benefits of risk control. Dead branches can be expected to degrade over time with the probability of failure increasing as a result. Because it is dead, some of the usual benefits from the branch have been lost and it will be appropriate to consider whether the financial cost of risk control would be proportionate.

Example 3.

	Target		Size		Probability of Failure		Risk of Harm
Range	3	x	3	x	3	=	1/500 000

In Example 3, a 200mm diameter defective branch overhangs a country road along which travel between 470 and 48 vehicles each day at an average speed of 50kph (32mph) (Target Range 3). The branch is split and is assessed as having a probability of failure for the coming year of between 1/100 and 1/1 000 (PoF Range 3). The Risk of Harm is calculated as 1/500 000 (yellow) and it needs to be considered whether the risk is ALARP. The cost of removing the branch and reducing the risk to Broadly Acceptable (1/1 000 000) is estimated at £350. To establish whether this is a proportionate cost of risk control, the following equation is applied. £2 000 000 (VOSL) x 1/500 000 = £4 indicating that the projected cost of £350 would be disproportionate to the benefit. Taking account of the financial cost, risk transfer to arborists and passers-by, the cost could be described as being grossly disproportionate, even if accrued benefits over say ten years were taken into account.

References

DfT. 2000. Highway Economic Note N. 1. '*Valuation of Benefits of Prevention of Road Accidents and Casualties*'. Department for Transport.

DfT. 2010. Department for Transport. *Vehicles Factsheet*. Department for Transport, London. pp. 4. Available for download at <http://www.dft.gov.uk/statistics>

Forest Research. 2010. *Benefits of green infrastructure* - Report by Forest Research. Forest Research, Farnham, Surrey. 42 pp.

HSE. 1996. *Use of Risk Assessment Within Government Departments*. Report prepared by the Interdepartmental Liaison Group on Risk Assessment. Health and Safety Executive. HSE Books, Sudbury, Suffolk. 48 pp.

HSE. 2001. *Reducing Risks: Protecting People*. Health and Safety Executive, [online]. Available for download at <http://www.hse.gov.uk/risk/theory/r2p2.pdf> (accessed 05/11/2013).

HSE. 2013. *Sector Information Minute - Management of the risk from falling trees or branches*. Health & Safety Executive, Bootle, [online]. Available for download at http://www.hse.gov.uk/foi/internalops/sims/ag_food/010705.htm (accessed 05/11/2013).

ISO. 2009. ISO Guide 73. *Risk Management Vocabulary*. International Organization for Standardization. Geneva. 17 pp.

Tritton, L. M. and Hornbeck, J. W. 1982. *Biomass Equations for Major Tree Species*. General Technical Report NE69. United States Department of Agriculture.

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