

*Contrasting different methods of assessment was extremely useful. Excellent conference...excellent location! Well Done!"*  
*Nick Lumb*

## Presidents Pulpit

### Glenn Gorner - President UK&I Chapter

*Welcome to this conference special edition of Treeline. As you probably know, our 2004 conference was fully subscribed and was generally hailed as a great success. This year we decided to focus the whole conference on one theme - "Strategic Tree Risk Management", a subject that should be on the mind of everyone who has responsibility for trees. A combination of the right venue and an impressive cast of speakers allowed us to extend our packed programme over two days, enabling us to combine in-depth theory sessions with more practical, outdoor workshops.*

We could not have found a better venue. Chateau Impney, an impressive 19<sup>th</sup> century copy of a French chateau, set within its own parkland, offered excellent modern conference facilities, sumptuous accommodation and a mouth watering cuisine. The parkland trees, some of which were in various stages of collapse, offered excellent subjects for the practical sessions.

Our keynote speaker, Dr. David Lonsdale, set the tone by reminding us why tree risk management is important and what simple measures all tree owners can take to reduce that risk. Ed Hayes, who teaches widely in the United States, stressed the importance of acquiring a sound grounding in basic tree biology and tree bio-mechanics to aid identifying and assessing potential tree hazards. The following three speakers, Mike Ellison, Julian Forbes-Laird and Nev Fay, each presented their own methods of tree risk management. During the second day, Mike, Julian, Nev and Ed each led interactive workshops to demonstrate their method and how they prefer to work. Perhaps unsurprisingly, this proved to be a popular part of the two days. I'm sure that many people learned as much, if not more, from the discussions that developed during these workshop sessions as from the formal presentations.

Back inside, Dealga O'Callaghan gave an insightful presentation on report writing, purpose and presentation. Charles Mynors, once more, reminded us of our legal obligations and Dave Dowson encouraged us to consider whether the tree risk management systems that we used in our professional lives were defensible. All our speakers were extremely professional and worked hard to present informative and highly topical papers. I would like to take this opportunity to publicly thank them for all their hard work. I would also like to thank Alan Reeves and Roy Finch. Alan chaired the early part of the first day and Roy steered the rest. Chairing a conference like this is no easy task and both deserve full credit for fulfilling their roles so well.

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In this special edition of Treeline, we can only provide you with the briefest of summaries from each paper. Unfortunately Dealga and Charles Mynors unable to contribute, but you will find their full papers in the extended edition. Happily there are lots of photos, plus a few comments from some of those lucky enough to attend. Hopefully, this will whet your appetites for early in 2005, when the conference proceedings will be published in full. In many respects, this conference has laid down a marker for this Chapter. During my Presidential address at the AGM, I said that we intend to develop the quality and quantity of educational opportunities for our members. For this to be successful, we need to hear from you. We are currently drawing together a training and events programme for 2005, but for any such programme to be meaningful, we need to be sure that we are meeting your needs. On page 10 of this edition, you will find a list of workshop titles. In the space provided next to each title, simply place a tick to indicate which are of most interest to you, cut out the whole thing out and post it to Jean at the Chapter Office. Do this as soon as you can – we look forward to hearing from you!

# Dave Dowson

## Is your system defensible?

*Statute law does not require the tree owner to maintain completely safe trees and it is certainly not practical or possible for a large organisation such as a Local Authority (LA) to inspect each tree on a daily basis. In my opinion the defensible system starts with understanding what the law requires of a system, it then requires the following elements to be written in to a policy adopted at executive level within the management structure of the organisation.*

- Mission Statement
- Policy Statement
- Operational details
- Tree Hazard Assessment
- System parameters
- Performance indicators
- Risk zones
- Training
- Failure Log
- Highway Trees in private ownership
- External Audit
- Recording

Above all, the system has to demonstrate responsible proactive management where the scope of inspection is defined and the recommended actions are acted upon. The documentation must be present and the whole programme is systematic to demonstrate to a judge that the tree owner dispensed its duty with "reasonable care" and took appropriate avoiding action as necessary to protect those who are "reasonably" likely to be affected by a tree. Since a presentation made at the Arboricultural Association conference 2003, I have had the opportunity to work with a large city council on developing a defensible system for them that meets the legislative criteria and one that is appropriate to them. Out of the combined works undertaken by their staff and myself has been born a process for developing a defensible system for an LA.

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This process is known as 'STORM': System for Tree Operation Risk Management, the contents which include the aid an LA requires to get a proactive system up and running where a reactive system exists. To test the likely defensibility of any system it requires pro-active testing and a modern approach to this would be to audit the system either internally or perhaps preferably by external audit. STORM Audit is an audit procedure developed with the aid of another LA.

### Audit Methodology

External or internal audit would entail office based visit(s), desk top study to examine the appropriate paper work policy/strategic documents, computer information; talk to staff involved in the system, track tree inspection processes through the system and examine completed tree works and recording systems. To visit trees under the control of the Council at the auditors direction and at random and track them through the system. Complete check lists in a systematic way recording completeness, partial or non-completeness of records related to the system in place. Additional notes will be made throughout the process and from the collective analysis a report will be produced to highlight the various strengths and weaknesses.

**Conclusions** - Where weaknesses are found they need to be highlighted in a report, an action plan for weaknesses found produced to strengthen the processes of a defensible system and prioritised to ensure they are dealt with first. In the process of developing an audit methodology I have externally audited a LA that was served with an improvement notice last year.

The preliminary results of that audit demonstrated that a very good policy document had been constructed, however it did not include system parameters, rules of operation or performance indicators and this has led to the two following fundamental conclusions which will need to be addressed:

- Departmentalised nature of the set up does not help information flow and regulation of the system parameters.
- Rules of operation are broken so as to fundamentally flaw the system whereby the Council are not discharging their Duty of Care reasonably.

The system of tree inspection produced may not be the system that a tree owner desires due to limited resources however, any system can be defensible. To have no system at all is the error.

## David Lonsdale

### The importance of tree risk management

*Everyone with responsibility for trees needs to be aware both of their value and of the risks that they may pose to people and property. Risks need to be assessed and managed so as to balance them against the value of the trees concerned.*

My presentation will focus on the questions that might be asked in a Court of law in the case involving a tree-related injury.

A judge will want to know whether a tree inspection system was in place prior to the accident. Trees can be inspected in the absence of a system, but a system helps to ensure that the frequency, scope and rigour of inspections are appropriate for the trees and sites concerned.

Key questions about inspection would be concerned with the following:

- Frequency of inspection
- Thoroughness of the inspection procedure
- Competence of the inspector(s)

There will also be questions about the condition of the tree concerned; e.g. –

- Did the tree show signs of requiring more detailed inspection and/or remedial action?
- If a more detailed inspection was done, what were the findings?
- Was remedial action taken prior to the accident?
- If there was no remedial action, why not?

For adequate answers, written evidence is very important.

Trees can be inspected and managed without keeping many records, but legal defence would then rely entirely on witness statements made after the event. A robust defence depends on record-keeping of all aspects of tree risk management, including the inspection system, training of inspectors, the results of individual inspections and the planning and implementation of remedial action.

The rigour required in the procedure, implementation and recording of inspections depends on the general level of risk associated with the trees and sites concerned. If this risk is low, there may be no need for formal, regular inspections.



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There would still be a need for evidence that the situation had been adequately appraised as being low-risk.

Even if formal inspections are deemed unnecessary, the value of informal or ‘opportunistic’ inspections cannot be stressed too strongly. These depend on observations made by people primarily engaged in other activities but having a responsibility to look out for anything that deserves further attention. Their observations should always be followed up and the results recorded. Opportunistic reporting is valuable not only in low-risk sites but also during the intervals between the regular inspections that take place at sites of higher risk.

As the competence of inspectors is of key importance, it will be scrutinised in any legal proceedings. The level of skill, and hence training, required to recognise signs of mechanical weakness in trees should be appropriate for the role of the person concerned. This could be the reporting of ‘opportunistic’ observations by a tree warden or a non-specialist employee, or it could be the formal inspection of trees at various levels of detail.

Where trees are of high value and cannot easily be inspected using simple techniques of visual observation, the services of a specialist consultant may be needed.

There are many kinds of visual signs of potential hazards and I will show some examples of these. They include weak attachments at forks and the bases of branches, signs of poor vitality, soil conditions, previously uprooted trees nearby, external signs of decay.

Another important aspect of tree risk management is to avoid increasing the risks associated with trees. Thus trees near people and property should not be harmed so as to encourage decay and instability. Equally, people and property should not be brought unnecessarily close to trees that have a high probability of failure and whose value outweighs any case that can be made for felling or severely pruning them.

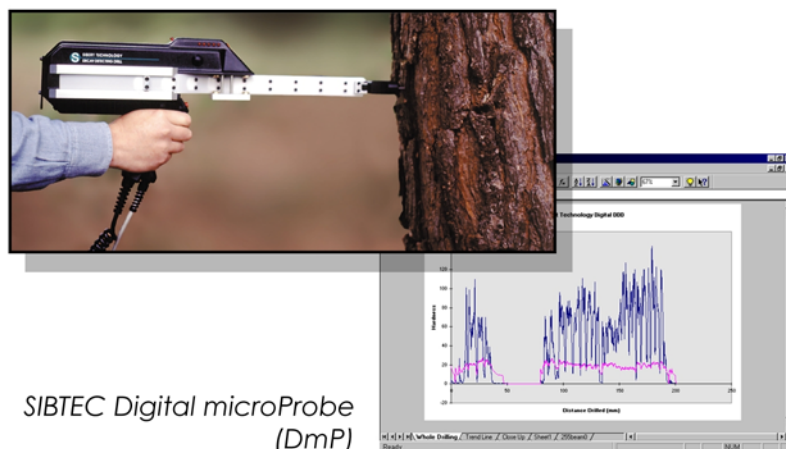


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"I do a lot of risk assessment. The methodology and calculations presented at by the speakers are very useful - and quite an eye opener! I enjoyed the practicals and the powerpoint displays were just great."  
Bob Widd - Frost Landscapes - Tree Manager

# JULIAN FORBES-LAIRD

## THREATS

### Tree Hazard Rating, Evaluation And Treatment

*THREATS is a method for identifying and managing hazard trees, presented, in its full form, as a two-page pro forma data recording sheet. It can also be condensed to give a ready-reckoner for use in large-scale tree surveys. It has been developed by JFL over six years to offer a systematised and consistent framework for hazard-tree decision-making, based on the mathematical quantification of arboricultural judgement.*

THREATS offers the user a means of recording tree inspections in a methodical way and categorising the level of risk that an unsafe tree poses to life and property.

Based on this information, THREATS suggests the time limits for intervention and/or re-inspection, allowing the tree owner/manager to prioritise any required intervention. In essence, THREATS works as follows: the tree surveyor categorises within given option ranges the three components of tree risk, being likelihood of failure, target value and severity of impact of failed tree or branch. Each option within each range is allied to a numerical value. Thus three values are derived which, when multiplied together, give a 'hazard rating' for the identified defect. This score is then compared to a pre-determined range to identify the threat category of the tree from 7 ('extreme') to 1 ('insignificant'). The threat category in turn determines the urgency of the response, and also any re-inspection frequency if/as required.

In addition to the above, THREATS can assist tree managers in a number of other ways including identifying tree inspection requirements, calculating budgets, defining levels of tree hazard to laymen, and in benchmarking for best-value assessments. This system is offered to the arboricultural industry strictly on a licensed basis. All licensed practitioners have successfully completed training in the use of the method, having first satisfied the author as to their competence as tree surveyors. It is emphatically not designed to provide the answer to the question of tree safety. It is, however, a consistent, transparent and systematic way of classifying and managing hazard trees.

For further information contact the author: **JULIAN FORBES-LAIRD** MICFor, Dip.Arb. (RFS)  
Arboricultural Association Registered Consultant

"I am currently studying for my Tec-Cert so the conference really helped me on my way to this qualification. Fantastic!"  
Mark Ashman, Hill-Fort Nursery, Garden and Tree Care Centre, Leicestershire.



Neville Fay—see page 8

EzyTree

*The art and science of tree risk assessment continues to evolve as we increase our knowledge base and with field experience. Trees do not fail at random.* Tree failures are predictable over a broad time range. Risk assessment is not an exact science, but a science nonetheless and one that is constantly advancing. The components of tree risk assessment include the tree's failure potential, an environment conducive to tree failure, and a target. An Arborist performing tree risk assessments must be well trained in compartmentalisation, structural defect, and tree biomechanics. The process for evaluating the risk of tree failure begins with visual inspection for defects (visual tree assessment, VTA), followed by sounding for suspect decay and probing, if necessary, with a portable drill, increment borer, or an advanced decay detection device. Formulating a decision involves considering several factors, including multiple defects, species characteristics, location and extent of decay, characteristics of decay organisms, crown size, crown ratio, stem taper, exposure, target considerations, tree value, and owner attitude. The Arborist should possess a high level of comfort and experience with the inspection process. It takes a trained eye to recognize the subtle signs of impending mechanical failure. However, the possible result of over-reading these signs is overreacting. Any existing signs of failure must be evaluated and understood to determine their cause. Because every tree is different, performing tree risk assessments is a learning process.

# Risk Assessment and Tree Biomechanics

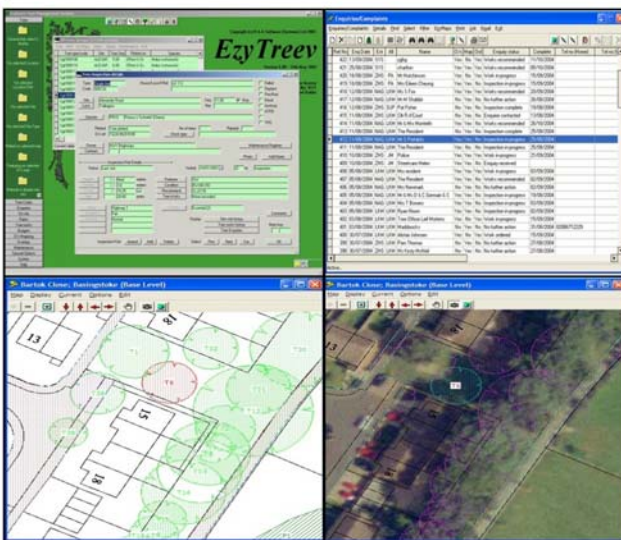


*"I feel that the content of the conference is especially well timed."*  
Gareth Hare,  
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# Neville Fay

## Considering Tree Risks: Defendable & Not Defensive Arboriculture

*UK safety regulation is characterised by the notion that risk control should seek to attain a level "as low as reasonably practicable", conventionally referred to as the ALARP principle. The meaning of "reasonably practicable" is well established in English case law.*

“Reasonably practicable” is a narrower term than "physically possible" and seems to me to imply that a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them -- the risk being insignificant in relation to the sacrifice -- the defendants discharge the onus on them.”\*(1949).

The requirements of reasonable tree risk assessment and management need not place particularly onerous demands on those responsible for and advising on trees. The history of UK legislation in risk regulation is long established dating back as far as the thirteenth century. ‘Reasonableness’ is key to the legal framework within which arboriculturists may be involved in managing tree for occupiers and others responsible for trees within the context of common law. This would entail that suitable systems are in place to ensure that trees may be inspected at appropriate levels and frequency within the scope of available resources, and that measures are taken to ensure that risks are maintained at a reasonable level.

The concepts of what is ‘practicable’ and ‘proportionate’ are inherent in the expectations of risk control and cost-benefit appraisal in the interests of managing risks within tolerable limits. Additionally the Health & Safety at Work Act 1974 also embodies the notion that the body that is responsible for causing a risk is best placed to control it.

Therefore self-regulation has been a fundamental tenet of the risk management process over the past three decades.

The arboricultural industry and profession has been proactive in raising awareness of such issues, particularly where members are made aware that systems may need improvement or review. A wide range of techniques and device-based applications are available to the arboriculturist to assist in diagnosis of structural stability in trees. Such devices require enhanced skill levels among those who use them, particularly in relation to the interpretation of results and conclusions regarding appropriate action to mitigate risks. Appropriate training and skill appraisal is necessary to ensure that device-based applications are effectively used. Training in appropriate use also applies to innovative methods of tree risk assessment are now also available (such as the QTRA) and IT-based tree recording systems.

The formulation of an effective tree risk management policy (TRMP) and a reasonable strategy for its implementation (TRMS) is an essential requirement of a defendable approach to arboriculture – but if it is reasonable and rational its implementation need not be defensive.

\*Judge Asquith, Edwards v. National Coal Board, All England Law Reports Vol. 1, p. 747 (1949)

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**Neville Fay - Arboricultural Consultant**  
[www.treeworks.co.uk](http://www.treeworks.co.uk)

## A word from the editor...

The ISA could not have chosen a more perfect and idyllic setting for this year's conference, nor one more suited to the practical applications of the theories introduced in the discussions. Perfectly manicured grounds teamed with the eye catching beauty of Chateau Impney made this a memorable event; both incredibly industrious in the learning atmosphere whilst at the same time serene and relaxing.

Dinner on the first day was sublime, after which everyone drifted into the bar - a fantastic opportunity to catch up with colleagues. The annual awards were made during the evening meal, where Glenn presented the Chapter award of merit to Jim Clarke and Nelda Matheny. Mike Ellison received honorary life membership for services to British arboriculture and life membership was also given to outgoing President Alan Reeves. Hal Appleyard was presented with the award for services to the chapter.

On the second day the weather was delightfully autumnal as everyone flooded outside for the practical demonstrations. This was a great way of seeing the theories presented put into practice and gave everyone a chance to get some fresh air and explore the gardens which, incidentally, boast some of the most stunning trees and waterfalls imaginable.

The AGM was also held during the two days, where Alan Reeves moved to Immediate Past President and the President's chair was taken by Glenn Gerner. Andy Johnson took the post as President Elect with David Lloyd-Jones moving to Vice President. Finally, Craig Johnson will be taking over the post as Director (3 year term).



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Thanks must go to whole ISA team for a most enjoyable two days, to the speakers for their enthusiasm and dedication, and last but not least, to you, all the delegates, for your support!

Kate Erswell  
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### ReSIBTEC DmP provides most accurate measurement of wood decay

The message from the conference is that arborists need good monitoring systems for the trees in their care. This can also help to increase the confidence of the general public. An unrecognised tree hazard could cause injury to people or damage property. Arborists know that identifying hazards begins with a thorough visual inspection based on sound arboricultural knowledge. But when they are worried about the safety of a tree, they need effective technology. Something which provides accurate measurements to back up their original visual inspections. And that's where the SIBTEC DmP (Digital microProbe) comes into its own.

Twelve years ago, SIBTEC Scientific was asked to produce a non-destructive way to detect and measure wood decay.

'When we were developing the original micro-drill, the only technology in general use was the Increment Borer,' said Michael White, MD of SIBTEC. 'The Shigometer had appeared briefly but it was too complex for practical use.'

Michael said that during the last decade, since SIBTEC introduced the micro-drilling technology, he has seen more exotic technologies, such as thermal imaging, magnetic resonance, ultrasound and even gamma rays being tried out. However, he believes that because basic mechanical principles underlie micro-drilling, it will always remain the most practical non-destructive method of testing wood. 'We now have over 100 Local Authorities as customers and sell the DmP to over 40 countries world-wide. The DmP still remains the most effective and accurate way of measuring the quality of wood.'

# Mike Ellison

## QUANTIFIED TREE RISK ASSESSMENT SYSTEM

*Most tree defects can be identified and assessed by a skilled inspector, but there is no evaluation methodology currently in general use that enables the inspector to quantify risk in a way that the risks associated with the retention of trees can be compared with a broadly acceptable level of risk. The Quantified Tree Risk Assessment system expands concepts developed by others and enables a probability of significant harm to be applied to tree-failure risk. By evaluating the components of a tree-failure hazard and assigning to them estimates of probability, the proposed system enables the skilled tree inspector to calculate the product of the probabilities to produce a numerical estimate of risk. The use of quantification in the assessment of tree hazards enables property owners and managers to operate, in as far as is reasonably practicable, to a predetermined limit of reasonable or acceptable risk.*

If absolute safety from tree failure were achievable, society would almost certainly find the cost in terms of tree losses unacceptable. The concept of 'reasonable practicability' is a central tenet of English law, which is evident throughout the English Health and Safety legislation and guidance (e.g. Health and Safety at Work Act 1974), and in judgements of the higher courts in relation to tree failure. This concept is embraced in the Quantified Tree Risk Assessment system.

Quantified Tree Risk Assessment provides a framework for the assessment of the three components of tree-failure risk – Probability of Failure, Impact Potential and Target Value. Having assessed the value or usage of targets upon which trees might fail, tree owners and site managers can establish whether or not and at what degree of rigour tree inspections are required.

By allocating quantifiable values to the probability of failure and impact potential of trees and to the targets upon which trees might fail, the arborist can, with training, assess tree-failure hazards with sufficient accuracy that property owners and managers are able to balance the risk of significant harm from tree failure against a level of reasonable or acceptable risk. Using the Quantified Tree Risk Assessment system, it is possible, not only to identify unacceptable risks, but also to identify the elements of the risk, which when modified will effectively reduce the overall risk of harm in the most cost efficient or appropriate manner.

**Target Evaluation.** A target is anything of value which could be harmed in the event of tree failure. Frequent inspection of trees and assessment of associated risks may be essential in areas of high public access or where trees are within striking range of valuable or fragile structures. Conversely, in a location without structures and having very low public access, assessment of tree hazards may be unnecessary. The target value is the most significant and most easily quantified element of the assessment. In Quantified Tree Risk Assessment, evaluating the nature of the targets within a survey area before the assessment of trees enables the tree manager to prioritise inspections and establish the degree of rigour required of the risk assessment.

Weather conditions greatly influence tree failure. A walk through woodland and other recreational areas after a moderate storm will often reveal paths and tracks littered with dead and recently living branches. The same weather conditions might at the same time result in reduced pedestrian access to recreational areas, substantially reducing the risk of harm from tree-failure. People may venture beneath trees during high winds either in the pursuit of recreation, thus voluntarily contributing to their increased exposure harm from tree failure, or out of necessity such as en route from home to a workplace. Even in the latter example, weather conditions may be so extreme that the risk of harm from the failure of not only trees but the collapse of buildings and other storm related hazards is such that to venture out at all would be foolhardy. Conversely, the risk of branch failure in tree species susceptible to summer branch drop increases during periods of hot dry weather when pedestrians might seek shade beneath trees. Quantified Tree Risk Assessment includes a facility for considering these scenarios.

**Impact Potential.** The system categorises impact potential by the diameter of tree stems and branches. A biomass equation derived from weight measurements of trees is used to produce a data set of comparative weight estimates of trees and branches ranging from 10 to 600 mm diameter.

**Probability of Failure.** Accurately assessing the probability that a tree or branch will fail is highly dependant upon the skill and experience of the assessor. Having assessed the tree, the assessor visualises 1,000, 100, or 10 similar trees in a similar state in the same environment and estimates how many would be likely to fail during the coming year.

The Quantified Tree Risk Assessment system not only significantly reduces the influence of assessor subjectivity upon the outcome of the risk assessment, but also applies a robust structure to the assessment procedure, requiring detailed assessment of the tree only where there is a significant likelihood of unacceptable risk. By first evaluating and mapping both the general nature of the tree population within an administrative area and the range of targets upon which they could fail, the manager of a large tree population can identify the interface between trees and targets, thus enabling prioritisation of risk assessments. A post-mature tree population adjacent to a busy urban thoroughfare might require biannual assessment, whereas the same tree population in a remote wilderness might never be assessed in detail. Between these extremes is a range of inspection frequency, which can be applied as appropriate to the situation.

Use of the system without training leads to misapplication of the data. To ensure, insofar as practicable, that the value of the system is maintained through consistent application, training and ongoing development through a licensing programme has been developed.

We have compiled the following list of workshops for next year. Please tick any you feel would be of interest to you and return to Jean at the Chapter office with your name and address. The address is on page 1. We value your feedback!

- Trees and the Law
  - Tree Biology
  - Tree Bio-mechanics
  - Trees in relation to Construction
  - Landscape Design
  - Trees and Subsidence
  - Soils and Soil Forming Materials
  - Managing Urban Woodlands
  - Rigging
  - Health and Safety
  - Tree Management Systems
  - Small Business Management
- Please do add your own suggestions.....  
 .....

*"Good to keep up-to-date; remind and revise!" Mr & Mrs Gallagher, ASG Tree Services.*



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