

Why are Ancient Yew Trees a Special Case for Management?

- Put quite simply, yew trees are the most long-lived of our native trees. Owing to their peculiar biology, they have an exceptional potential to live indefinitely. They are evergreen and grouped with conifers, but do not bear recognisable woody cones (although the small male and female reproductive structures are referred to as cones based on form). Also, they possess highly durable wood; more so than most other conifers.
- The British Isles and Wales in particular are of international importance for ancient yew trees. Wales has the highest concentration of ancients, as a consequence of association with Celtic saints.
- Ancient trees are recognised especially for three main categories of value: Aesthetic, Biological and Cultural, which respectively relate to their form and position in the landscape, their associated biodiversity, and their historic/mythical/spiritual/artistic associations. A large part of current literature on trees is focussed on broadleaved species, particularly the oak – the national tree of England, which supports a particularly diverse ecosystem. Oak supports many insects and other wildlife both on its living parts and in its dead/decaying/dysfunctional wood, which supports a rich saproxylic (dependent on dead or decaying wood) beetle fauna. While the saproxylic fauna of yew may be limited in comparison with that of other native species, the dense evergreen foliage and diversity of niches in old yew trees provide valuable shelter for over-wintering invertebrates. The lesser focus on yew is perhaps a consequence of its low overall associated biodiversity, which is due to its highly developed toxic armoury. Despite the relatively small number of species supported by yew, it is a bountiful winter food source for thrushes and other avian fauna, provides cavities as habitats for birds and bats, and hosts a specific plant gall, induced by the insect *Taxomyia taxi*. The principal values of yew trees are, however, of a spiritual and cultural nature, perhaps attracting historians and spiritualists to their study more than biologists. It is the other-worldly and true ancientness of yews that sets them apart from other trees, but their fascinating biology and intrinsic value should not be understated.
- Ancient yews share the physical characteristics of deciduous ancient trees such as hollow trunks, branches, cavities, splits/cracks and aerial roots. Perhaps even more than other species, they have well developed mechanisms for re-generating themselves i.e. natural strategies for longevity.
- For most tree species, crown-size (i.e. the height and spread of their branches) is usually smaller in the ancient stages of life than at the peak of maturity. For example, studies of oak trees show a permanent shrinkage of the crown, known as retrenchment or ‘growing downwards’ after they have attained stately maturity. In contrast, the crowns of ancient yews can be described as pulsating; i.e. growing outwards, and then reducing via dieback and large branch failure, followed by growing outwards again. Sections of trunk can decline while others burgeon over long and non-human timescales. This process can take place over several decades or even centuries. To understand yew trees truly, one has to abandon human concepts of time and travel back to a distant past while looking to an indefinite future. Despite the longevity of the yew, a tree can be destroyed by a single thoughtless act and the greatest threats to its existence are misguided human perceptions of risk and tidiness, disturbance of its environment and sometimes well intentioned (but flawed) ‘management’.
- When a yew stem starts to become hollow, the living tissues of the surrounding bark can produce new (adventitious) roots, which become ‘internal roots’ by growing down into the hollow. This is another survival strategy, enabling the tree to extract mineral nutrients that

are being released by decay, after centuries of being locked up in the central wood of the stem. After growing down to the base of the tree, the internal roots continue to thicken and to unite, in effect building new stems within the 'shell' of the original stem. This can happen in also in other tree species but yews often live so long that their internal roots can eventually grow large enough to provide considerable structural support. It is even possible for such roots to support the entire tree if the original stem has become completely decayed. Surviving parts of the original stem may, however, continue to grow, in particular with bristling epicormic growth. Consequently, ancient yews such as the Ankerwycke Yew near Runnymede become complex living sculptures where the wood seems almost fluid. They are also adept at layering i.e. rooting from branches touching the ground- vegetative propagation. Hypothetically, the old tree could decline over millennia as the new tree grows to replace it in a slightly removed, new location- sometimes described as a walking tree...

What are the Main Threats to Ancient Yew Trees and how can they be Mitigated by Management?

Inappropriate tree work on ancient yews can be a threat. Thus, work should generally be sensitive, minimal and done with hand tools where possible.

Threats may arise also from other management that is planned near an ancient yew. Examples include existing graves management, the siting of new graves or benches etc., together with proposals for new buildings or changes in site layout.

Thorough assessment should always take place before any prescription and action.

The following is a list of considerations with regard to assessment methods, specifications and specific potential threats/management issues:

- Excessive prescription should not be a substitute for proper assessment.
- Any pruning prescribed should be the minimum necessary to achieve the objective and targeted for the required purpose e.g. full crown reduction is not generally advisable as a default option except for specific well considered reasons- reduction could be peripheral i.e. on one side- to allow space between branches and the church building.
- Pruning cuts should be kept as small as possible.
- Where branches are split, heavily weighted, have poor unions to the parent branch/main stem or have notch stresses where failure could occur; any end weight reduction that may be required should be minimised as far as is practicable to retain crown form.
- Large diameter (often low) branches should only be removed after full consideration has rejected other options. There are very limited circumstances under which such work will be necessary. Where space allows, encourage the development of layering/stabilising branches.
- Propping and bracing options combined with or as a substitute for pruning need to be carefully considered and specified. Considerations include allowance of some natural movement to build reaction wood, avoidance of point stresses, padding to avoid abrasion etc.

- If any tree-related subsidence claims arise, these should be upheld only if supported with detailed site investigation reporting: the London Tree Officers Association (LTOA) provides a useful Risk Limitation Strategy.
- Work specifications should follow **British Standards Institute: BS 3998 (2010) Tree work – Recommendations**. BSI, London.

Also consider guidance in:

Brown, G. E. 1972: The Pruning of Trees, Shrubs and Conifers. 2nd Edition Revised and Enlarged by Tony Kirkham 2004. Timber Press, Cambridge.

Cooper, M.R. and Johnson, A.W. 1998. Poisonous Plants and Fungi in Britain: Animal and Human Poisoning. 2nd ed. The Stationery Office, London.

Lonsdale, D. 1999. Principles of Tree Hazard Assessment and Management. HMSO: London.

Lonsdale, D. (ed.) 2013. Ancient and Other Veteran Trees: Further Guidance on Management. The Tree Council, London.

National Tree Safety Group, 2011. Common Sense risk management of Trees: Guidance on trees and Public Safety in the UK for Owners, Managers and Advisers. Forestry Commission, Edinburgh.

Read, H. (Ed.) 2000. Veteran Trees: A Guide to Good Management.

Veteran Trees: A Guide to Risk and Responsibility. English Nature: Peterborough. English Nature 2000.

Rose, D. R. Date not confirmed. The Health of Yew- Pathological Advisory Note. Forest Research, Alice Holt Lodge, Farnham, Surrey.

- Churchyards and other historic church buildings are very often in Conservation Areas- (S. 211 Town and Country Planning Act 1990 [as amended] in England and Wales). Any work on trees in excess of 75mm. stem diameter (usually measured at 1.5m. above ground level) or 100mm. stem diameter with regard to thinning operations to benefit other trees; requires six weeks notification to the Local Planning Authority except where valid exemptions apply (Local Authority/legal guidance should be sought with regard to what constitutes an exemption).

Anyone who cuts down, uproots, tops, lops or wilfully destroys or wilfully damages a tree in a Conservation Area without giving a Section 211 notice (or otherwise in contravention of Section 211) is guilty of an offence. Note: Damage is not restricted to aerial parts of the tree and includes tree roots i.e. the whole tree is protected- root damage as a consequence of excavation close to or under trees can therefore be an offence.

- Specifications for tree work should be clear, unambiguous and precise so that anyone can read them and know exactly what is required.
- Decaying wood in yew trees is of low conservation value as an invertebrate habitat in comparison to the decaying wood of native deciduous trees. Retention of larger dead branches/long stubs (where structurally sound) is desirable to maintain a natural appearance. When shortened, jagged cuts/torn ends are better aesthetically than straight saw cuts. Removal of small secondary branches <50 mm can accelerate natural processes related to improved light conditions by stimulating new growth from epicormic buds (i.e. where the main stem is heavily shaded in the absence of natural branch breakage or shedding). Caution should be exercised with regard to the excessive removal of dead

branches, which can reduce crown robustness and open up other individual branches to more wind loading and potential failure.

- Pruning/crown lifting over paths should take account of funeral processions carrying coffins with regard to height clearance from ground level.
- Pruning over pre-existing graves is suggested to provide clearance of 0.5 m maximum to allow for re-growth and to retain attractive crown shape.
- Pruning to avoid contact with/damage to church architecture will generally involve peripheral reduction, often targeted to a section of one side of the tree's crown to address the immediate concern as dictated by the local circumstances. The aim should be to allow for re-growth and to keep pruning work to the minimum.
- Damage to walls/paths etc. that may be directly or indirectly associated with tree roots, stems or branches will need careful consideration and may require input from structural engineers to achieve balanced, workable solutions that avoid tree loss.
- Regular removal of accumulations of yew foliage etc. from church gutters is advisable to prevent architectural/tree conflicts developing (negative perceptions of untidiness/damage etc.). Gutter guards may be considered to address this issue
- Disturbance of the rooting environment as a consequence of new graves, burial of human ashes, services (utilities), new paths, church extensions etc. Careful consideration is required with regard to siting of structures (or alternative solutions to the erection of structures). Detailed assessment should take place and where there are no alternative sites, technological design/innovation can be applied to limit impact on root systems. It should be noted that, while structural roots will generally be confined to beneath the crown spread, smaller-diameter roots extend much further: at least as far as tree height measured radially and often to 2.5 times the crown spread, depending on rooting conditions/subterranean barriers to rooting etc.
- Grave digging: There is not indefinite space for graves in a churchyard and squeezing in new graves in crowded spaces under or in close proximity to old Yew trees can be extremely damaging to tree roots, causing physiological damage, dieback, decline and sometimes whole tree death. It is advisable that additional space should be sought for graves to provide capacity for future facilities where required.
- For trees of 1250 mm. diameter (all ancient and most historical Yews), a circle of 15m. radius as a Root Protection Area) is recommended under BS 5837 (2012) Trees in Relation to Design, Demolition and Construction- Recommendations.
- In addition to direct, physical root disturbance, the siting of memorial 'ash' gardens under trees can result in excessive phosphate loadings that can inhibit the development of the beneficial fungal mycorrhiza (root-fungus associations) that trees depend on for healthy growth.
- Excess spoil from grave digging should not be deposited under or near the crown spread of trees as this over-burden can cause soil compaction leading to root asphyxiation and is also aesthetically unsightly.
- Crown lifting and peripheral crown reduction should not always be 'balanced' as a certain degree of asymmetry can be desirable or even essential to retain individual form.

- Pruning for line clearance (utility treework) – phone lines, low voltage overhead wires – should always be planned only in consultation with the local electricity or telecom provider. Pruning should be carried out aesthetically and in accordance with industry best practice.
- Competing vegetation in the vicinity of old yews is a management consideration: This may consist of other, more vigorous, younger trees and shrubs growing around yews leading to shading issues and branch death or self-seeded/planted trees/shrubs e.g. Holly, Elder growing up through trees and causing partial shading. Competing vegetation can also reduce the aesthetic setting value of old yews.
- **Needle bronzing is a specific and little known phenomenon that can be observed in yew trees. It can give the appearance that the tree is dying, leading to advice that the tree should be removed. The bronzing effect is caused by a concentration of oils by the tree in response to physiological stress, e.g. cold winds. Although this condition may persist for more than one season it must be stressed that it is a reversible condition not requiring action and that the tree can be expected to revert to normal (green) appearance in time. Great care should be exercised as this is a foliage effect, not indicating that there is any structural weakness due to an irreversible decline in vitality. (See Rose, D. R. The Health of yew- Pathological Advisory Note.)**
- Ivy management: Ivy is highly beneficial to many species as habitat or food resource being a micro-habitat in its own right and should not be removed without careful ecological assessment including checking for nesting birds. Nevertheless, in many cases it is advisable to remove it from ancient and veteran Yews because it shades out or inhibits the ability of the tree to produce epicormic growth that can enable swift responses to stress/traumatic events. Healthy epicormic growth is important for the development of the tree and also for aesthetic reasons.
- All parts of the yew tree are toxic, except the red fleshy fruit (aril) that surrounds the seed. This gives rise to concerns of poisoning, particularly with regard to children and calls for trees to be removed based on fear. However, in general the hard seeds are not chewed and pass through the gut without releasing the toxins they contain. Consequently, the risk of death or severe poisoning from eating yew fruits is low.
- The fruits from female yew trees can make paths slippery and hazardous, particularly to senior citizens/less able people. This is generally a seasonal problem that can be addressed by temporary use of e.g. rubber matting.
- It should be noted that other ancient/heritage trees, both broadleaved and coniferous, may be found in churchyards; these should be identified and noted, with similar care exercised in their management and protection.
- Because of their particular biology and longevity strategies, often great age and centuries of environmental interaction; ancient Yews exhibit great inter-specific diversity of form; consequently, the concept of Individual Tree Care Plans tailored to the individual tree and the management of its surroundings should be strongly considered.

Notes:

1. This document is designed to be a stand-alone document, but also to be used in combination with similar information provided by Russell Ball and Toby Hindson of the Ancient Yew Group to set new standards, better practice and to enable greater protection for ancient yews through the reduction of haphazard, unnecessary and damaging/destructive operations.

2. The information contained in this document is not considered to be comprehensive, rather organic, enabling the further development and refinement of advice on ancient yew care.

3. This is a discussion document and any informed comments that are received will be considered in an ongoing review process.

4. This document has been edited after peer review by Russell Ball, Toby Hindson and David Lonsdale who provided valuable comments from their diverse arboricultural expertise on the initial draft. David Lonsdale kindly re-edited the final draft version and suggested minor technical amendments and changes to the text that have been adopted and are respectfully acknowledged by the AYG.

Chris Knapman F Arbor A, Dip Arb (RFS)

Member of Ancient Yew Group

Co-opted Member of the Ancient Tree Forum

Revised January 2021