



## Climate change and trees

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At the 2007 AA Conference in Warwick, Jeremy Barrell highlighted what many arboriculturists have known for a long time; that we are not succeeding in our struggle to retain urban trees and the future is going to be uncomfortably hot because of that failure. Subsequently, his observations were given some weight through the publication of *Trees in Towns II* (Britt & Johnston, 2008). This government-backed research has identified that new tree planting is down and our biggest trees are becoming increasingly vulnerable. In this article, Jeremy reports on the gathering momentum to reverse this decline and how arboriculturists can have a central role in that turnaround.



During my last 30 years as a climber, contractor and consultant, the cumulative tree loss I have seen in our towns and cities is staggering. Across the country, big trees are being removed on a daily basis and our urban landscape is changing for the worst. It is commonly argued that the removed trees are replaced, which is traditional tree management, so where is the harm? Superficially, a reasonable response were it not for the fact that those new trees often die because there are no funds to ensure successful establishment, or they are small species, with no potential to mitigate the losses they were intended to replace. From my position, I do not see a sustainable tree population, in good shape for the future. I see our heritage of oak, beech and pine being replaced with a legacy of cherries, thorns and rowans; very pretty, but is this what we really want or need? If our responsibility as tree managers is to conserve our tree heritage and secure a viable future, then we have failed dismally in that duty.

For most arboriculturists, this is not a startling revelation; their daily grind is to fight for trees, but it has been a demoralising struggle. Developers are slow to grasp that established trees can transform new neighbourhoods. Planners consistently fail to give significant weight to trees in their daily decisions. Government, both local and national, shows little long-term leadership, preferring short-term, vote-winning sound-bites to the more intangible sustainability benefits that may take a generation to arrive. Landscape architects are good at boundary treatments, surfacing and shrubs, but often do not have the expertise when it comes to tree management. Similarly, urban designers, in

their enthusiasm for reducing crime and encouraging green travel, often ignore the biggest single natural element in our urban landscapes, trees. More often than not, highway authorities see trees as more of a problem than a benefit, with a presumption to remove rather than replace. Architects frequently forget that design does not stop at the front door, and that trees around buildings can enhance functionality and style. Insurers have consistently failed to factor realistic tree values into subsidence claim management, which is resulting in a significant attrition of urban trees, especially in our inner cities. In almost every sphere of urban life, it seems that trees are being shuffled down the list of short-term priorities, with little regard for the long-term consequences.



**Landscape character is changing: the traditional large mature trees (left) are being replaced by smaller varieties with little potential to contribute to the wider setting in the same way (right)**



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By failing to give trees significant weight in our decision making, we are all contributing to urban deforestation; lots of small losses make a big, big impact

Of course, it is easy to blame everyone else (especially when it's true), but the real challenge is to turn all this dismay into hope and an enthusiastic way forward. I have to admit that it has been grim to witness this decline because the failures listed above are real and they are tough to even remotely counter, let alone overcome. It is deeply demoralising to consistently fail, which has been the rhythm of arboricultural life for many years now. So, it is with some relief that I perceive our professional landscape is changing, and very rapidly too. During the last few years, climate change has emerged from obscurity to permeate every thread of human life; it is here and it is beginning to force change at a breathtaking rate. At last, the rest of the world is realising what arboriculturists knew all along; that trees matter and investing in them now will bring significant future benefits. And if trees matter, then so do the people who manage them; I predict that arboriculture will soon be on the map, and in a big way.

Although people intuitively know that trees are good, one of the most difficult challenges for arboriculture has been to focus on one benefit that effectively embodies all that goodness in a way that is easily understood and grabs the public imagination. It is hard to value human wellbeing, visual amenity and the benefits of wildlife, which has made it easier for social priorities such as health, education and transport, to seem more deserving of scarce funds. Climate change predictions are altering this historic perspective, with an increasing body of research indicating that the temperature buffering benefits of trees are greater than previously appreciated. With anticipated inner-city temperature rises in excess of 4°C by the end of this century, suddenly it is much easier for the public to visualise how important trees really are. Indeed, there is emerging research to

suggest that they are so effective at temperature buffering that an increase of 10% in our present urban tree canopy cover and green space would offset all but the most extreme temperature rises predicted through global warming (Gill *et al.*, 2007). Although not the answer to all urban sustainability problems in isolation, big trees are obviously part of the solution and there is a credible body of opinion that we need more of them (Shaw *et al.*, 2007). Shade is on the UK agenda for the first time and it is the arboriculturists' job to deliver it.



Australians highly value trees because of their obvious temperature buffering benefits. In contrast, the traditional UK mindset of wanting more sun rather than less has contributed to a gradual erosion of canopy cover.

The challenge for arboriculture is to find the enthusiasm and drive to do this when history tells us it is such a tough nut to crack. If past-experience is anything to go by, then the chances for success do not look good, but I believe a closer analysis of the issues reveals a less gloomy prospect. There is no doubt that urban canopy cover is being eroded, but it is relevant that the nature of the losses are varied and widespread; there is no single culprit or one big reason why it is happening. Instead, there are many reasons, each individually quite minor. This is cause for optimism because it indicates that a workable solution could consist of lots of minor changes and adjustments, rather than one big fix. Big changes are tough to achieve because they cost money, existing legislative frameworks need updating and people have to alter their lives. In contrast, small changes are not so hard; an adjustment here, increased emphasis there, better understanding of the reason to change and a co-





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ordinated approach are not going to have a dramatic impact on everyday lives. However, together their cumulative impact could be very effective indeed. Localised big changes are not necessary; widespread and co-ordinated small changes are a low impact strategy with the potential for a high impact result. I think the case for more trees is widely accepted in principle, but raising their priority within mainstream urban management is where our focus is now needed.



**Failed tree planting strategies are not new. This 1970s development had real potential for big trees with space to mature, similar to those that can be seen on the skyline. Instead, it delivered a landscape of cherries, thorns and rowans, with no potential to contribute to the wider setting.**

My 2007 AA Conference presentation elicited a very strong response; there was unanimous feedback voicing disappointment at declining canopy cover and almost demanding that something be done to reverse the trend. It was obvious that an urban canopy initiative was needed and it should be driven by arboriculturists as the people with the expertise to put practical solutions in place. In response to this, I teamed up with Neville Fay from Treework Environmental Practice, to review the issue and see if we could facilitate a solution. The essence of our analysis was that the current fragmented and unfocused approach was not working and a higher level of co-ordination was a fundamental requirement, concentrating on two areas. On a functional level, it will be immensely helpful to bring together practical expertise and knowledge to enable canopy increase and disseminate that information to all who can use it. On a political level, consistent guidance that trees should be given significant weight in decision-making is urgently needed to rally the professions that can make the difference. Planners, architects, engineers, landscape architects, insurers and urban designers all intuitively know that trees matter; a consistent

political drive to emphasise that point is the catalyst needed to transform belief into action.



**Chris Baines (centre), Jeremy Barrell (left ) and Neville Fay (right) will launch Seminar XI with a simple message: big trees matter and we don't have much time!**

The Treework Environmental Practice Seminar XI, *Trees: the key to climate proofing our cities*, is the start of the process; the identification of the detail of the problem and exploration of what solutions will be viable. To do this, we have brought together an impressive international line-up, led by the UKs Professor Chris Baines, to review what is going wrong, and drawing on their experience to propose practical approaches that offer resolutions to these difficult issues. Top speakers, including Richard Nicholson and Peter Thurman from the UK, Jim Urban from the US and Professors Cermak and Fassbinder from mainland Europe, will give this a truly international perspective. It is anticipated that the proceedings will be published to provide a baseline for developing an improved understanding of the impact of urban deforestation and a co-ordinated approach to reversing the trend. Further seminars are likely to explore the emerging solutions and develop a strategy for disseminating that information in a way that will empower individuals to make a difference. With the means of delivering increased canopy cover spelled out, an effective strategy for implementation will rely on a simultaneous drive from politicians making it a strategic objective and a surge from enthusiasts on the ground insisting it can be done.



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Although the leadership for increasing urban canopy cover must come from government, the vision and practical solutions are very much the responsibility of arboriculturists. Here are some small changes that would make a big difference. None of them require major legislation or lifestyle changes, just slight shifts in attitude and emphasis.

- Urban canopy cover must be factored into planning decisions. Off-site contributions for new tree planting, where new on-site tree planting is not sustainable, need to become a mainstream feature of planning for climate change. Cash contributions for mitigating tree loss must be ring-fenced so that the money is not hijacked for other non-tree related projects.
- Specialist advice from tree officers is essential if local politicians, planners and urban designers are to be aware of tree species and forms that reduce inconvenience to future occupants and maximise the efficient use of available space. Tree officers are in a strong position to identify unused urban planting sites to tie in with off-site planting arrangements relating to high-density developments that cannot accommodate new trees.
- Many new developments with space for new trees have none. The legislative provisions for councils to maximise the potential for new tree planting are available, but not being consistently used.
- Councils must improve enforcement of planning conditions relating to new tree planting and protection of existing trees. New tree planting to comply with planning conditions is often not effectively enforced so there is a very low survival rate. Similarly, existing trees identified for retention are often prematurely lost because of ineffective enforcement of conditions. Urban canopy mitigation promised at the planning stage is not being consistently delivered because of council administration failures.
- Canopy cover must be given more weight by architects in new building designs where trees can enhance the architecture and improve the quality of living conditions through their temperature buffering benefits.
- Designer trees should be considered for urban areas where special forms and growth characteristics make them more sustainable than traditional species. The potential for using trees with form suited to challenging site conditions is not fully exploited. For example, tall, thin trees, with the ability to provide vertical green space with a small footprint, are widely available but not commonly used.
- Greater emphasis must be placed on the dual use of space in parking areas by incorporating trees through the increased use of special below-ground preparation. Emerging technology for establishing and sustaining trees in difficult conditions is not being effectively utilised. Products for improving the below ground conditions significantly widen the scope for successful tree establishment in previously unsuitable locations, but are not commonly used.
- Landscape architect organisations must identify and disseminate guidance to their practitioners on the importance of tree size potential as a strategic objective of new planting schemes. Traditional planting strategies must be reviewed and revised species lists compiled based on maximising size potential for the space available whilst minimising the inconvenience for future users. These priorities must be communicated to the practitioners who produce the landscape designs to help deliver structural landscaping suited to temperature buffering.
- Feedback from maturing planting projects must be collected to identify the species and forms most successful in tough urban conditions. Non-traditional species that have a track record of tolerating greater temperatures and coping with the harshness of the urban environment must be trialled. There is an urgent need for co-ordination between nurserymen and arboriculturists to identify, promote and supply species and forms that are likely to be most suited to sustainable urban development. Unsuitable species are still widely planted, resulting in high failure rates.
- Traditionally, highway authorities have often perceived trees as being a problem they would rather not have and policies have been dominated by no replacements. Despite the availability of tree pit designs to minimise the risk



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of problems, many potential sites in parking areas and other surfaces are not planted, which is a lost opportunity to increase canopy cover

- Emerging technology of soil cells for the dual use of growing trees and buffering rainwater runoff is available and should be considered in new designs.
- Minimum levels of site investigation must be agreed with other professions for implicating trees in subsidence damage so that trees are only removed where they have been proved to be a problem. If insurers want to be seen as responsible in a global warming context, they must begin to factor realistic tree values into their claim management strategies as the rule rather than the exception.
- When implicating trees in subsidence damage, judges must be mindful of the value of trees and, if appropriate, place significant weight on the evidential requirements set by the appropriate professions and the local incidence of damage. In some civil subsidence claims, the judiciary have implicated trees in damage with very low levels of evidential support. This results in councils being reluctant to resist demands to fell from allegations of subsidence damage; trees are removed, despite very little evidence that they caused damage, because it is too risky to go to court.
- Areas of open land that could accommodate trees without any obvious conflicts, are often not planted. Many areas of land with little potential for development have a great potential to support trees, but are not used because there is no initiative to do so.
- Poorly conceived and implemented tree planting is often seen on council owned land, which cannot achieve its full potential. Councils should be setting the example and yet it is common to see inappropriate trees planted ineffectively on their land. Smaller species such as cherries, thorns and rowans are frequently planted where much bigger species would be feasible
- Political leadership is needed on the issues of the temperature and rainwater runoff buffering benefits of trees, and their contribution to sustainable development. Existing government guidance must be modified to ensure that the objective of increasing canopy cover is given significant weight in the planning process. Regional and local government must incorporate urban canopy cover targets into structure plans.



It is common for there to be robust resistance from highway authorities to planting trees in and near the highway despite tried and tested methods of doing so.



A recent council development with great potential for large tree species. Instead we have cherries, thorns and rowans, with little potential to contribute to landscape in the same way as the trees over the road.



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Great foresight in Poundbury, Dorset. Apart from its obvious aesthetic benefit, this plane will mature with a crown well above the rooftops, offering valuable shade in the summer without restricting too much light in the winter.



Insurers can take a lead in reducing tree loss by factoring realistic tree values into claim management and by supporting the call for high levels of evidential proof in subsidence claims

In summary, small changes in everyone's approach to trees have the potential to increase urban canopy cover, with very little impact on our daily lives. Although the driving force must come from politicians, arboriculturists are the people who know about trees and the practical solutions have to come from them. With government acknowledgement

providing the strategic impetus and the practitioners developing solutions, the middle managers will have little option but to give trees more weight in the decision making process. A joined up approach to urban management, with trees as an essential element of a sustainable infrastructure, will outlaw the 'fell it now and worry about it later' attitude that has resulted in the current urban deforestation crisis. Getting all the interested parties working together, with a focus on what to do, where to do it and who does what, is where we need to make progress. Seminar XI is going to be a great start, with arboriculturists leading the way.

*Trees: the key to climate proofing our cities*, is a landmark seminar to be held at the Royal Geographic Society in London on 10 July 2008. For programme details and to find out what you can do to make a difference, visit [www.treeworks.co.uk/seminars](http://www.treeworks.co.uk/seminars).

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