TREES: THE KEY TO CLIMATE PROOFING OUR CITIES

INTERDISCIPLINARY SOLUTIONS TO PLANNING FOR BIG TREES

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Introduction

This conference is the first of a new TEP series exploring the effects of climate change and the mitigating potential of trees. The conference organisers consider the case for climate change and global warming to be established beyond reasonable doubt. The question is what the arboricultural profession, together with others involved in planning, engineering, architecture and design, can contribute through knowledge and expertise to ensure that our cities continue to be viable for future generations.

Research shows that there is a simple correlation between the quantum of canopy cover and temperature moderation, demonstrating that the urban community considerably benefits from efficient tree planting and maintenance. The correlation is such that the number of leaves is a function of the cooling efficiency in trees and, moreover is directly influenced by the number of stomata in leaves (the organelles facilitating transpiration). As the greater the number of leaves and stomata the greater the cooling effect through transpiration, big trees with larger foliar mass are better than small trees, so the bigger the crown canopy the better from this point of view. There is even inbuilt adjustment, as the number of stomata increases with light intensity. Conversely, when we lose tree canopy, the local hydrological effects can be very considerable. For some time we have been aware that this has consequences for soil moisture levels, but now it is becoming increasingly clear that there are added impacts from the loss of large trees - principally upon temperature and local climate. In this sense, the larger the tree lost the greater the impact.

A model for influencing change

To specialists in arboriculture, the needs of trees in the urban environment are patently clear. We are aware that a vast number of urban trees have to ‘work’ (carry out essential transportation, respiration and photosynthesis) in soil-root conditions for which they have probably never evolved. These hostile conditions need to be taken into account when planning for the success of future planting. A key aspect of this is the cyclical root disruption typically affecting street trees, already shoe-horned into restricted conditions for growth.

The arboricultural profession acting on its own has limited potential to make necessary tree management adjustments to ensure that urban tree loss is at a minimum while maximising large tree canopy cover.

The recent collaborative experience of the National Tree Safety Group (NTSG) is worth considering as a model for interdisciplinary cooperation capable of influencing policy; in our case we are concerned to increase urban tree canopy cover. The NTSG evolved in response to the loss of trees as a reaction to risk-aversion following key legal cases where harm was caused from structural tree failure. Concerns regarding risks from trees reflect the

sociological context in which arboriculture operates; i.e., where tree professionals, influenced by social trends, find they are not the leaders driving tree policy development but rather are reacting to circumstances and operating without a coherent agenda or clear leadership.

The experience of the NTSG is that, initially through a series of TEP seminars prior to the formation of the Group, within eighteen months change has begun to be affected in thinking and practice. This is because, led by the Forestry Commission, the NTSG aspires to be as widely inclusive as possible, engaging stakeholders with direct professional interests in trees (advisers, managers, consultants) as well as those with contingent interests by virtue of natural appreciation (community groups and conservationists) or through work-related decisions as non-tree specialist (courts, legal profession, press). A key aspect of the success of this group derives from formal collaboration for the first time being developed between tree professionals and non-tree experts, some of whom furnish arboriculturists with information from the fairly alien field of risk decision analysis.

In a similar way it is envisaged that this conference, our first on the climate-proofing potential of trees in cities, offers the prospect of an effective strategy to both conserve existing large urban trees and ensure that appropriate provision is made in all urban planning decisions to facilitate effective planting and maintenance so that trees will grow to maximise the tree population at optimal large canopy size.

It makes sense therefore that a national policy for a sustainable tree population should seek to conserve the best of our mature and old tree populations while insuring optimum circumstances for a durable replacement generation. This has difficulties in an economy based on short-term returns on investment. Nonetheless, given its importance, any management model will need to take account of the fact that the lifespan of trees typically extends well beyond that of humans. At the risk of sounding obvious, our strategies need to account for the very long-term benefits that trees confer if we are seriously to plan for a viable national tree population. Such a planning vision will probably need to be based on a minimum hundred-year generation. Controlling urban tree root severance and engaging utility companies as stakeholders in this process would seem a reasonable cost-benefit strategy for ensuring that there is a secure urban environment for future generations.

As our colleagues in the risk analysis profession have indicated, in order to formulate a unified statement, first one must understand the science. From this position it would be possible to build a shared philosophy capable of influencing professional practice. Borrowing from the NTSG experience, again with the support of key sponsorship from the Forestry Commission, there is a real opportunity to develop such an understanding through the contributions from the speakers and breadth of interests represented by the delegates attending this conference.

Conclusion

Given the importance of trees for insuring that we can continue to survive in the spaces we inhabit and that these spaces are protected and tolerable for human enjoyment, we need to take account of the human risks from tree removal, particularly of large trees. Clearly, if large trees are the most important for urban human well-being, being also the type of tree likely to suffer greatest damage from infrastructure management or threat of removal through risk-aversion, resources will need to be directed to their protection and conservation through cooperation between professions.