AIR-CON OR COOL AIR?

Andy Tipping MICFor, Trees and Woodland Manager, explains how the London Borough of Barnet is tackling the Urban Heat Island through a targeted tree planting programme

The recent heatwave experienced throughout Britain has once again alerted people to the changing climate we now experience. Weather events are becoming increasingly dangerous and loss of life due to heat-related deaths are predicted to increase significantly, with a recent Commons select committee predicting a 300% increase by 2050[1].

The Urban Heat Island (UHI) can be simply understood as the absorption of heat during the day in town centres and built-up areas, which is then released during the evening. A combination of vehicle traffic and emissions, air conditioning and urban canyons caused by high-rise buildings (*greedy* buildings as some are known) all contribute to UHI. Most importantly, black asphalt road surfaces absorbing direct sunlight is one of the main culprits and it is here where we may be able to do something to reduce the impact.

Walking in exposed sites in full sunlight is obviously uncomfortable, and finding the relief of the shade of a mature tree is most welcome; urban tree planting is an easy way to introduce shade into the built environment.

This thermal image shows the difference in temperature beneath trees and the exposed road surface

Sometimes the simplest actions can result in the most effective outcomes, and we have been thankfully swamped with evidence of ecosystem services over the past few years, clarifying what we always knew: trees are good for people, and stopping sunlight being absorbed by our roads and buildings is one of the most obvious health benefits for all.

During the night, Central London can be 10°C hotter than the Home Counties, which makes sleeping uncomfortable for all. More seriously, this impacts the vulnerable, young, elderly, and those with existing health problems. This can be a particular concern in the suburbs, where the elderly and families with young children tend to live.

In 2017, we published our Tree Policy, in which we aimed to plant 900 trees each year for the next five years, replacing our dead and dying ornamental trees, creating avenues in parks, and targeting areas of high temperatures and poor air quality. A lot of these sites overlapped.

We have targeted areas close to our trunk roads, the main source of nitrogen dioxide, utilising maps published by Greater London Authority (see opposite). We have catalogued all roads within 100 metres of the orange and red areas and will be systematically planting trees in these roads. We are also targeting roads adjacent to schools to try to reduce the pollution caused by parents sitting in cars with engines running to either heat or air condition their vehicles. In our parks, we are planting on the south and west facing sides of children's play areas to provide both shade to cool down the play area and

to protect children and their carers from the harmful effect of ultra-violet rays.

Strategic tree planting in areas of known high temperatures is a low-cost way of trying to reduce temperatures, while the policymakers battle away with reducing nitrogen dioxide from diesel vehicles on our streets and making UHI part of National Planning Policy Framework. Currently, builders have no obligation to address these issues or to design sustainable future-proof buildings.

This is by no means a London-only problem: every urban area in the country is affected by this. The most polluted cities in Britain in terms of poor air quality are (in order): Glasgow, London, Leeds, Nottingham, Southampton and Oxford[2].

This heatwave has also caused a major issue by killing off a lot of trees that have been "hanging in there" from previous years. Drive down any street and chances are there will be a dead tree; replanting these presents additional challenges. We know the usual work necessary for planting: which species of tree do we plant? How big will it grow? Where do we buy it from? How do we make sure that it succeeds? How will it be funded? Who will plant the tree? Who will water the tree? Who will monitor the establishment of the tree? How do we measure success?

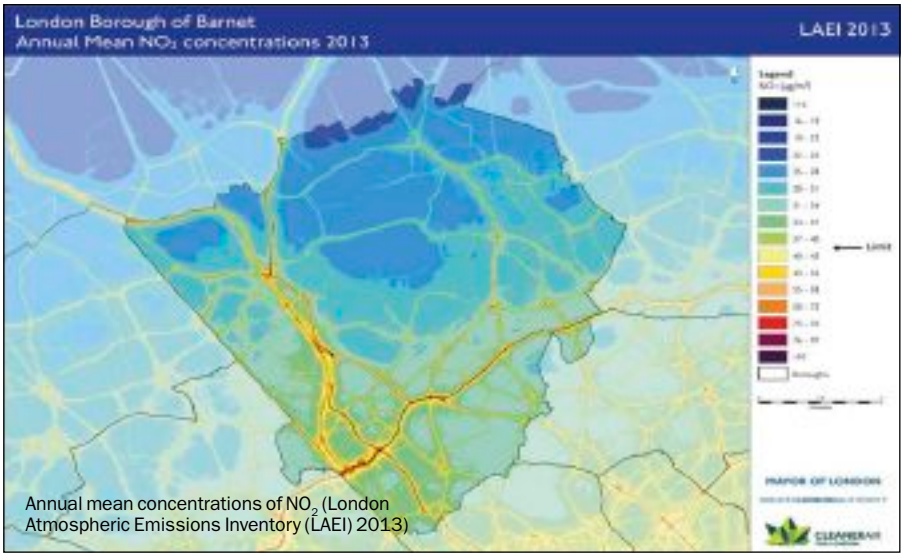
Firstly, there is an abundance of literature and we want tree species that will grow and probably be able to cope with drought conditions. The new free to download Trees and Design Action Group document by Andy Hirons and Henrik Sjöman, *Tree species Selection for Green Infrastructure*,[3] is a welcome addition to our toolbox. We want to grow the biggest trees possible to increase canopy cover in keeping with their location – the 'Right Tree, Right Place' principle. We will only buy from nurseries following biosecurity protocols and guidance from the profession, stipulating a minimum of a full growing season in the nursery for imported trees (non-UK stock).

Once we have bought the trees, the next business is employing contractors to plant and carry out sufficient aftercare. Everyone is quite rightly concerned by tree planting failure rates, whether on public land or through private development, and these failures are too flippantly described as 'inevitable'. Both the public and private sectors need to take this seriously: planting trees and watching them die is amateur hour and not in line with the professional standards we should expect in our sector.

Employing and overseeing contractors who are armed with clear and comprehensive specifications including the correct depths for planting is vial. Watering during the spring and summer months for the first two or three years is also vital, and needs to be planned and resourced both financially and with a workforce that is willing to visit the same tree week after week. The introduction of irrigation bags and barcode scanning to monitor watering visits has made managing this work more realistic and significantly higher success rates have followed. In short, acting as professionals should act has delivered massive improvements.

The London Tree Officers Association published a guide to sustainable water management in 2013[4] and this document remains an excellent guide to this simple, yet somehow tricky subject.

Lastly, the ramifications of a heatwave in an area of clay soils usually equates to a substantial increase in cases of subsidence. This can result in the inevitable loss of trees and an increased focus on financial risk. There have been productive meetings of the Joint Mitigation Protocol Group this year and a new draft is circulating. Hopefully this will be in place for the claims coming in.



Annual mean concentrations of NO_2 (London Atmospheric Emissions Inventory (LAEI) 2013)

Reference

1. https://www.parliament.uk/business/committees/committees-a-z/commons-select/environmental-audit-committee/news-parliament-2017/heatwaves-report-publication-17-19/
2. https://www.worldatlas.com/articles/most-polluted-cities-in-the-united-kingdom.html
3. http://www.tdag.org.uk/species-selection-for-green-infrastructure.html
4. https://www.ltoa.org.uk/resources/sustainable-water-management