

A photograph of a stone path leading to a lawn. The path is made of rectangular, light-colored stone slabs set in a dark, sandy or gravelly ground. The path starts in the foreground, goes straight for a few steps, then curves to the right and continues into the background. To the right of the path, there is a large, well-maintained green lawn. The overall scene is outdoors, likely in a garden or park setting.

LONDON: GARDEN CITY?

Investigating the changing anatomy of London's private gardens, and the scale of their loss

LONDON: GARDEN CITY?

A research project by Chloë Smith on behalf of London Wildlife Trust, Greenspace Information for Greater London and the Greater London Authority.



Gardens make up much of London's green space. They are valuable for both people and wildlife because they provide a significant amount of London's open space and habitat. Climate change means that the extent and quality of gardens may become increasingly important as they also have a role to play in keeping the city cool and in preventing surface-water flooding. But, until now, the character and scale of London's gardens as a green space resource have not been fully documented. This report reveals the changing anatomy of London's private gardens. It investigates the scale of the changes to their extent and composition, in particular the loss of garden.

Acknowledgements

Many thanks to all those involved in the research. Dave Dawson collaborated significantly on methods, analysis and presentation. Guidance and editorial assistance were provided by Elaine Hughes, John Archer, Mathew Frith, Mandy Rudd, Peter Massini, Matt Thomas, Catherine Harris, Barnaby Dawson, and others. Matt Davies contributed the original idea as well as project support. Dave Allen and other volunteers generously gave their time and access to their gardens.

This project was made possible by a grant from the Royal Society of Wildlife Trusts (RSWT).

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Introduction

Gardens are part of London's green infrastructure¹ - multifunctional spaces, fulfilling multiple roles. A key part of London's green cover, they form important wildlife habitat, both individually and as part of a larger garden network. People can benefit from direct contact with the natural world in their gardens. They are also the places where many Londoners play, grow food or simply escape from the hustle and bustle of the city.

As they cover nearly a quarter of Greater London, gardens are also important with regard to the predicted impacts of climate change by decreasing flood risk and reducing the urban heat island effect.

But gardens are not an homogeneous resource. Mostly privately owned, they can have variable management and

ownership, as well as being subject to passing trends and fashions.

An understanding of the current status and the changing uses of gardens is important for policy makers in London. In response to this need, London Wildlife Trust, Greenspace Information for Greater London (GiGL), the Greater London Authority (GLA) and the Royal Society of Wildlife Trusts commissioned this research project, to establish the structure and composition of London gardens and identify key land use changes over a period of eight years.

The research generates a baseline of information on London's gardens and their role for people, wildlife and the environment. It develops transferable methods of investigation and interrogates some key lines of enquiry from stakeholders.

In particular this research project:

- establishes the current garden resource in London
- quantifies recent land cover changes in London's gardens
- provides evidence for campaigns, policy and other action to promote and protect gardens as an important environmental asset

KEY MESSAGES

- gardens in London have changed significantly in recent years
- garden vegetation - including lawns and garden trees - is being lost
- the losses are due primarily to changes to garden design and management
- while development can have a big impact locally, the loss due to development across London is relatively small
- collectively these losses have implications for London's wildlife and our ability to adapt to the impacts of climate change

This document is a summary of a more detailed research report which can be found online at www.wildlondon.org.uk and www.gigl.org.uk

¹ **Green infrastructure** The open environment within urban areas, the urban fringe and the countryside. It is a network of connected, high quality, multi-functional open spaces, corridors and the links in between that provide multiple benefits for people and wildlife.



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Headline facts and figures

The anatomy of London's gardens today

- 37,900 hectares (ha), approximately 24% of Greater London, is comprised of private, domestic garden land.²
- Of that garden land, 57% - or 22,000ha - is vegetated cover (lawn, tree canopy and other vegetation). Therefore, approximately 14% of London is garden greenspace.³
- There are an estimated 3.8 million individual private garden plots (counting front, back and other kinds separately)
- There are estimated to be 2.5 million garden trees in London.

Changes in the composition of gardens

As a result of garden design and management

- The area of vegetated land present in 1998-99 had dropped 12% in 2006-08, a loss of 3,000ha.
- On average, an area of vegetated garden land the size of 2.5 Hyde Parks was lost each year.
- The amount of hard surfacing in London's gardens increased by 26% or 2,600ha.
- The area of garden buildings increased in area by 55% or 1,000ha.
- The amount of lawn decreased by 16% or 2,200ha.
- Overall vegetation in gardens decreased by 12% or 3,000ha

As a result of development requiring planning permission

- An average of 311 reported housing developments per annum occurred on private garden land each year.⁴
- On average, 500 gardens, or part gardens, were lost to development per year (we don't know how many new gardens were created in association with development)

Studying Greater London's gardens

This report documents a London-wide investigation of garden land cover, outlining the current baseline data, the number of gardens found in Greater London, and inferring a typical garden's land

cover composition. It also addresses key changes in that composition during the study period. This information was collated by comparing two sets of aerial photographs taken at different times.

Left: area in east London where gardens represent the only significant green space, 2006-08. Above: large back and relatively large front gardens in Croydon, showing more diverse land covers in these bigger gardens, 2006-08.

Garden ground cover findings

The total area of land classified as private garden in London is around 37,900ha (based on Ordnance Survey MasterMap). This is approximately 24% of the city's total area. In the context of other UK cities, the proportion of the capital that is domestic garden isn't unusual. Of course, not all of this land is vegetated. The total area of actual vegetated land in London's gardens is estimated

by this research to be 22,000ha, approximately 14% of London.

The total number of garden plots found in London is estimated to be 3.8 million. There are roughly equal numbers of front and back gardens, in the order of 1.8 million of each, with 280,000 'other' gardens⁵. This means there are about 2 million dwellings with associated private garden space.

This study has found that back gardens make up most of London's garden area, 24,000 ha, approximately 63% of the total. Front gardens contribute to most of the remaining garden land, 9,400 ha, approximately 25% of the total area. 'Other' gardens make up the final 4,600 ha, 12% of garden land area in London.

Land cover was determined by comparing colour aerial photographs taken between 1998 and 1999 with ones taken between 2006 and 2008. The images show the area covered by lawn, tree canopy or hard surfacing in a garden. The paired sample allowed land cover change to be examined, while the most recent photographs also provided information about the current cover for Greater London.

Photographs were stored and displayed in a Geographical Information System (GIS) and

overlayed by garden polygon boundaries from Ordnance Survey Mastermap® Topography Layer. A polygon is a topographical feature in GIS with an enclosed boundary.

Greater London's garden land was split into four kinds of polygons:

1. front gardens
2. back gardens
3. 'other' gardens (neither back nor front)
4. front and back gardens mapped as one combined polygon, which were then split in two

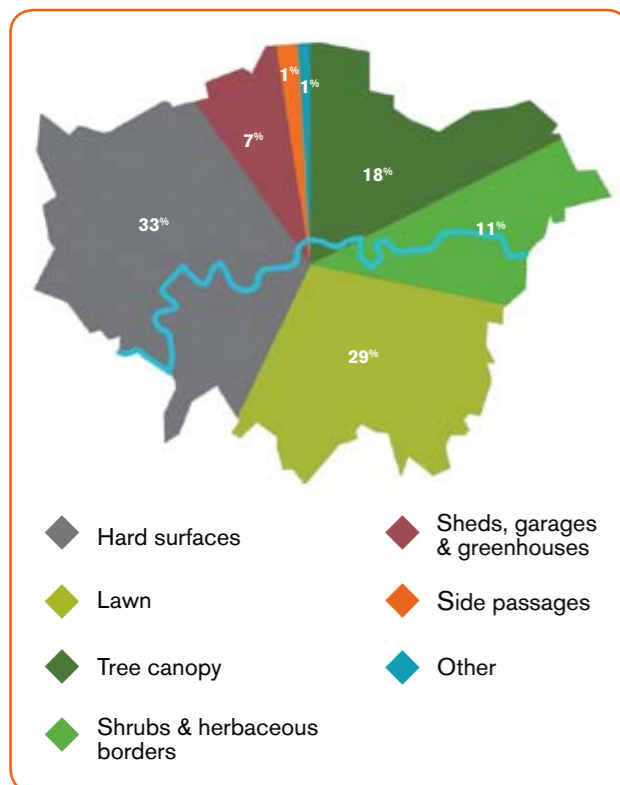
² The land studied included "private residential gardens" as identified within Ordnance Survey MasterMap Topology layer

³ Area, percentage and count estimates are presented to two significant figures throughout the report to reflect precision

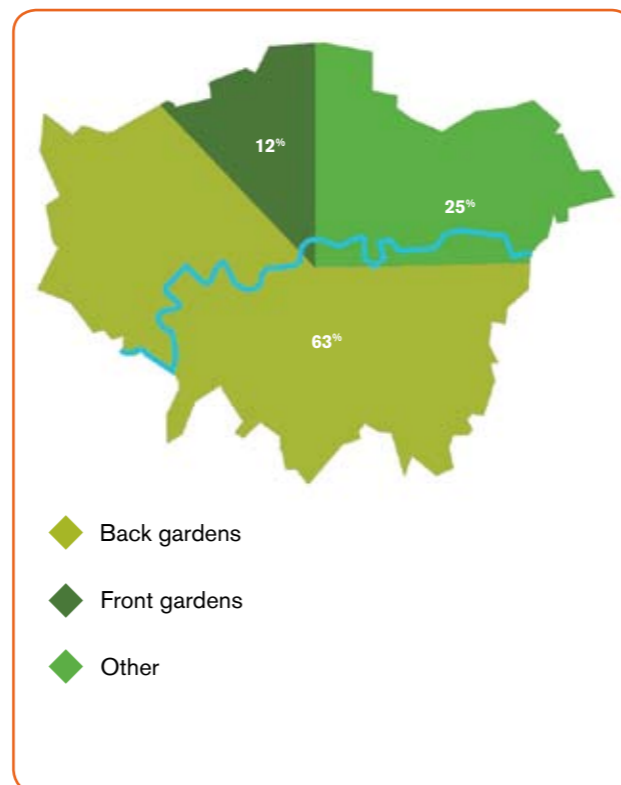
⁴ This relates to a separate study period covering three financial years between April 2005 and March 2008

⁵ 'Other' gardens are those rare plots that could not be classified as front or back gardens, for example those that are shared by a private flats building.

Estimated break down of London's overall garden area, by land cover type



Estimated break down of London's overall garden area, by garden type



The anatomy of the average garden revealed

The mean front garden size in London is estimated to be 56m², back gardens 150m², together 200m², and 'other' gardens 170m².

On average, 63% of a front garden is covered by a hard surface, with a little lawn, other vegetation and tree canopy. On average a back garden is 33% lawn and 22% hard cover, with a larger area of tree canopy and other vegetation when compared with front gardens. We can infer that the typical front or back garden in London would fit these descriptions.

There are estimated to be 2.5 million garden trees in London. Back gardens include about 1.9 million trees, front gardens 0.4 million and 'other' gardens 0.3 million. So on average there is one tree per back garden and every 'other' garden, and one tree in every

five front gardens. Tree canopy in gardens covers an area of 6,700ha, which represents 4% of London. Some of this canopy cover is overhang of non-garden trees, like street trees.

There is a considerable difference in average garden size between the boroughs. Outer London boroughs, such as Bromley and Barnet, have the largest average sizes, while inner London boroughs, like Hackney and City of Westminster, typically have small gardens. Overall, small gardens are much more common in London than large ones.

Unsurprisingly, there is a greater variety of habitat types to be found in large gardens than in small ones. It seems likely that a block of large gardens will have a greater diversity of habitat than a similarly large block of small gardens.

London's average front garden is 56m²

London's average back garden is 150m²

The average front garden is 63% hard surfacing

The average back garden is 33% lawn and 22% hard surfacing

There's an average of 1 tree in every back garden (totalling 1.9 million trees), and 1 tree in every fifth front garden (totalling 0.4 million trees). The remaining 0.3 million trees are found in gardens classified neither as front nor back, averaging 1 tree per 'other' garden.



Changes in composition investigated

The total area of vegetated land (lawn, tree canopy, other vegetation) in London's gardens is approximately 22,000ha. This is 57% of the city's garden land resource.

On average, 6m² of vegetation has been lost for every front garden in London and 11m² of vegetation has been lost for every back garden. The largest (and statistically significant) reduction in total area relates to garden lawns, decreasing by 2,200ha, a 16% loss, overall. The biggest increase in area during the study period relates to hard-surfacing (patios, paving, decking, etc), increasing by 2,600ha, a 26% gain. The cover of garden buildings (typically sheds, glasshouses etc. almost always in back gardens) increased by 1,000ha, a 55% increase.

As expected, hard surfacing covers a significant area of London's front gardens – 5,900 ha. This figure updates earlier findings in the 2005 *Crazy Paving*⁶ study which estimated a much lower total area for London (3,200 ha of hard surfacing). 47% of garden hard surfacing is found in front gardens, though they only form 25% of London's total garden space.

An area of vegetated garden land equivalent to 21 times the size of Hyde Park was lost between 1998-99 and 2006-08, representing 3,000ha or a 12% reduction. This constitutes an annual loss of an area two and a half times the size of Hyde Park.



Top: a highly designed garden
Left: decking
Right: front gardens lost to parking



⁶ Greater London Assembly Environment Committee, 2005



Left: song thrush © Tajinder Lachhar



Centre: bumblebee on teasel © Metalanguage Design



Right: common frog © Tony Canning

Below: hedgehog © Richard Burkmar

Assessing the impact of changing design and management

The research suggests that London's gardens are subject to some significant changes to their composition which might have more telling environmental impacts than previously thought.

The increase in hard surfacing is a particular concern. Many paving materials used in domestic situations are impermeable resulting in excess water running into sewers and drains, rather than soaking into the land.

In October 2008, planning regulations were changed so that planning permission is required for paving of front gardens, unless the paving is permeable. But this research shows that many front gardens have already been paved and a loss of permeability as a consequence of hard-surfacing may be an issue for back-gardens too.

Hard surfacing also stores more solar energy than vegetated surfaces. This energy is released back into the atmosphere as the air temperature cools. This contributes to the heat island effect, particularly at night during the summer months, exacerbating the adverse impacts of summer heatwaves.

The changes in garden composition detected in this study indicate a

potential loss of wildlife habitat during the period. The loss of each tree, hedge or square metre of lawn is a loss not only of the plants involved, but also for the wildlife that depends upon them for food and shelter. London's gardens provide valuable habitat for a range of wild plants and animals including birds, mammals, amphibians and a huge variety of invertebrates. Notable species include hedgehog, house sparrow, common frog, and stag beetle. Gardens are becoming an important resource for conserving some of these species.



On an individual scale, changes in the composition of garden land can have a significant impact on the biodiversity value of a garden. On a larger scale, such as a block of suburban gardens, significant changes occurring somewhere in the block will adversely affect

the variety of wildlife seen in neighbouring gardens.

There is also an increasing demand and desire for locally grown food. London's gardens could contribute to meeting this demand (as they have done in the past) but only if the quantity and quality of the resource, particularly a healthy garden soil, is maintained.



Top: blue tit © Bertie Gregory
Above: comma © Adam Wilson

Examining the impact of development

The research also looked at residential housing developments on garden land that required planning permission and had been implemented over a three year period between April 2005 and March 2008. It investigates the consequences of these developments and estimates the impact they've had on land that was previously identified as garden.

There was an average of 311 known housing developments per annum on private garden land in London during the study period. The land subject to development is estimated to have included at least part of 500 existing gardens each year, and, while development led to an overall gain in the number of gardens per year, the amount of garden greenspace actually decreased significantly, because these new gardens were very small resulting in a net loss in garden cover.

New gardens are created in Greater London every year, but this study was unable to fully quantify this. However, this 'new' garden land does not necessarily result in a net increase in garden land or an increase quality wildlife habitat; it is likely to be made mainly from existing gardens or as part of new development on greenfield

or brownfield land. So, we are confident that our findings would not be shaken by our inability to study this.

Unsurprisingly, there is a significant difference between land cover before and after housing developments granted planning permission are completed on garden land. Prior to development there is proportionately more vegetated land cover (tree canopy, lawn, other vegetation) than there are hard features (patios, side passages, buildings). After development, the proportion of vegetated land decreases, and hard features increase.

There is an average increase in hard-surfacing and buildings (including the house footprint) of 210m² per development. This, coupled with an average loss of 200m² greenspace per development (remaining loss was of miscellaneous surfaces), represents a loss of wildlife habitat and permeability to water.

On average 500 garden trees are removed each year due to development of houses on gardens. This means that 1.5 garden trees are lost on average per development project.

The loss of around 6ha of vegetated garden land to housing development on gardens each year, and a gain of an equivalent area of hard land cover, isn't particularly notable at a pan-London scale. At this rate it would take 30 years to lose 1% of London's garden vegetated land to housing developments. Nevertheless, on a local scale, the impact may be profound in terms of wildlife resources, flood drainage and climate change adaptation.



11m² of vegetation was lost from the average back garden, an 11% reduction in cover since 1998-99 (representing 8% of the average back garden area).

6m² of vegetation was lost from the average front garden, a 24% fall since 1998-99 (representing 11% of the average front garden area).

Conclusions

The research confirms that the composition of London's gardens is changing at a significant rate – an area two and a half times the size of Hyde Park of vegetated garden land is being lost every year - very largely as the result of very many small changes made to individual gardens. And the amount of hard surfacing in the capital's gardens has grown significantly - by over a quarter during the research period. Developments on garden land that require planning permission have a far less significant impact, although this shouldn't be under-estimated.

Although loss of garden land due to development needing planning permission is not significant on

a London-wide scale there may be impacts at a local level. The research indicates that policies in the replacement *London Plan* are appropriate by recommending that Boroughs may introduce a presumption against development of back gardens where this can be locally justified.⁷ Local approaches to the design of front gardens including the need for permeable surfaces should also reflect the broader policies of the *London Plan*.

The project highlights the scale of the garden resource in London and documents the impact that many individual garden management decisions have on the composition of that space across the capital.

Recommendations

It's never been more important that Londoners understand the value of our capital's gardens. A well managed network of gardens stretching across the capital would provide essential wildlife habitat and offer important environmental benefits in response to climate change.

Existing planning regulations have removed permitted development rights which allowed for the paving over of front gardens with impermeable surfaces and this has gone some way to addressing some of the issues highlighted by this research. Front gardens are regarded as de facto part of the public realm (albeit private land) and therefore it is appropriate for planning controls to constrain the ways these spaces are managed. These regulations do not apply to back gardens. However, normal planning controls do exist to prevent unacceptable development in back gardens, and many trees in back gardens will be subject to Tree Preservation Orders.

Ecological principles tell us that these losses of wildlife habitat do not simply displace the wildlife to other places, but rather they lead to losses of wildlife. A garden is not only valuable as a small privately owned space, but as part of a larger London-wide landscape, and has a role in supporting biodiversity at a neighbourhood scale.

Collectively, London's gardens might also play an important role in adapting to climate change. The research strongly indicates that these functions of gardens may be being compromised by changes to design and management.

This research highlights that the impacts of garden design and management on the environmental roles of gardens is an issue that needs to be addressed. It is not the role of the Mayor or environmental organisations to dictate how Londoners should manage their back gardens. Nevertheless, It is important that Londoners are made more aware of the collective value of their gardens for wildlife and climate change adaptation and that the decisions they make may have long-term consequences for local environmental quality.



Further information

Visit www.wildlondon.org.uk and www.gigl.org.uk to download a copy of the full Garden Research Project, its findings, conclusions and a complete set of references.

To find out more about creating a wildlife and climate friendly garden go to www.wildlondon.org.uk/gardenforlivinglondon

To explore what wildlife has been recorded in London's gardens you can visit 'What's In My Back Yard?' (WIMBY) at www.gigl.org.uk

To find out how you can do your bit for climate change adaptation and garden wildlife go to www.london.gov.uk/trees

For further information on wildlife gardening across the UK go to The Wildlife Trusts and the RHS' gardening website www.wildaboutgardens.org.uk



Above: gardening © Bertie Gregory

Right: garden © Richard Burkmar



Above: foxglove © Metalanguage Design

Back cover: outer suburban rear gardens © Mathew Frith

London Wildlife Trust is the only charity dedicated solely to protecting the capital's wildlife and wild spaces, engaging London's diverse communities through access to our nature reserves, campaigning, volunteering and education. www.wildlondon.org.uk

Greenspace Information for Greater London is the capital's environmental records centre. It collates, manages and makes available detailed information on London's wildlife, parks, nature reserves, gardens and other open spaces. www.gigl.org.uk

The **Greater London Authority** is a strategic authority with Londonwide role to design and deliver a better future for London. www.london.gov.uk

Royal Society of Wildlife Trusts There are 47 local Wildlife Trusts across the UK, the Isle of Man & Alderney, working for an environment rich in wildlife for everyone. The Wildlife Trusts are the largest UK voluntary organisation, dedicated to conserving the full range of the UK's habitats and species. www.wildlifetrusts.org

⁷ proposed Policy 3.5 'Quality of Design of Housing Developments'



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