Gardens as a resource for wildlife

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Our best picture of the garden resource across the UK comes from a compilation of 12 datasets assembled in 2008[1], and unattributed statistics below are from this source. Eleven of the datasets came from surveys conducted in urban and suburban areas over the previous decade, including the various phases of the Sheffield BUGS project[2]. The final dataset was the 2001/02 Survey of English Housing[3], a survey of approximately 20,000 households, stratified across the counties of England and covering all types of household, from rural areas and small towns through to city centres.

From this combined dataset, information was extracted on supplementary bird feeding, provision of nest boxes, and the occurrence of ponds and of trees taller than 3 metres. The number of households in the UK with access to a garden was calculated by finding the average fraction of households with a garden (using all surveys containing that information), then multiplying this proportion by the number of households recorded in the most recent (2001) UK census.

Number, size and area of gardens

On average, 87% of households had a garden which is higher than some previous estimates. Extrapolating to the 26,159,440 households in the UK, this equates to 22,738,563 households with a garden. Average garden size was 190 m^2 although this is very variable. In a study of 5 major cities, Alison Loram and her colleagues found garden areas varied from 3.6 m^2 to 2,290 m^2, depending on the housing type and density[4]. Back garden size is related to the type of property, as was shown by the Joseph Rowntree Foundation's study of 648 new-build houses[5]:

Property type	Average size
Mid terraces	42.5 m^2
End terraces	67.1 m^2
Town houses	141.0 m^2
Semi-detached	167.9 m^2
Detached	175.0 m^2

Front gardens (when present) are generally much smaller than back gardens, in London averaging about 56 m^2 or roughly a third of the back garden area[6].

Multiplying garden numbers by average area gives a total UK garden cover of 432,964 ha, which, using the standard area measure, is one fifth the size of Wales. Putting this in protected landscape terms, it is the area of the Norfolk Broads, and the Exmoor, Dartmoor and Lake District National Parks added together. One quarter of the area of a typical city (and half its green space) is private gardens[7], so the potential national significance of gardens as a resource for wildlife is clear.

Individual gardens may be quite small, but they add together to make large vegetated areas in our cities.

Google Earth image: Wallingford

Although the BUGS project showed beyond reasonable doubt that individual garden area itself has little or no effect on the wildlife within it[8] (largely because individual gardens are merely one part of larger blocks of green space), this does not mean that garden size is unimportant. As garden size changes, the probability that they will contain certain features beneficial to wildlife also changes, but the effects on the density of such features *per unit area* are complex[3].

Small gardens are much less likely to contain hedges, tall shrubs and trees, so as average garden size declines, the area occupied by these features also declines. On the other hand, the number of ponds and compost heaps might actually increase as garden size declines, despite the fact that they are less likely to be found in small gardens, as the effects of garden area are outweighed in this case by the increase in the number of gardens in a given area. Thus the tendency for new houses to be built at higher densities (and thus with smaller gardens) is a particular threat to trees and other tall vegetation in gardens, with potentially serious consequences for wildlife and the ecosystem services provided by trees. Taken together with an increasing trend for front gardens to be paved over for off-road parking, and for existing gardens to be built on ('garden grabbing'), both the proportional coverage of green space within residential areas and its value for wildlife seem likely to decline in coming decades.

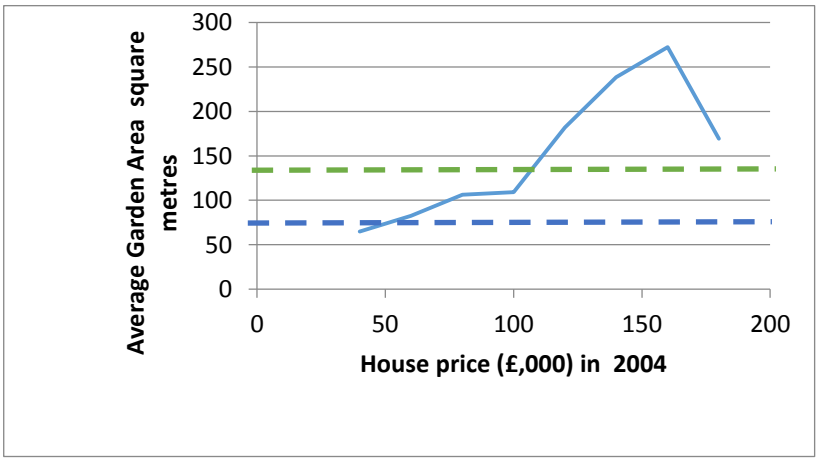
Changing garden size and character.

Gardens may occupy a large area, but this is decreasing. As property prices rocket away, new-build housing has much smaller gardens than older properties so more houses can be built on less land. Edwardian and pre-war suburban properties had much more generous garden areas than late 20th century developments, as these Google Earth images show.

Modern garden size - Didcot Oxfordshire

Edwardian garden size - Cholsey Oxfordshire

The Rowntree Foundation published a report on the character of new-build housing in 2004[9]. The size of gardens increased with the house price (the drop for the most expensive was thought a problem of small sample size).



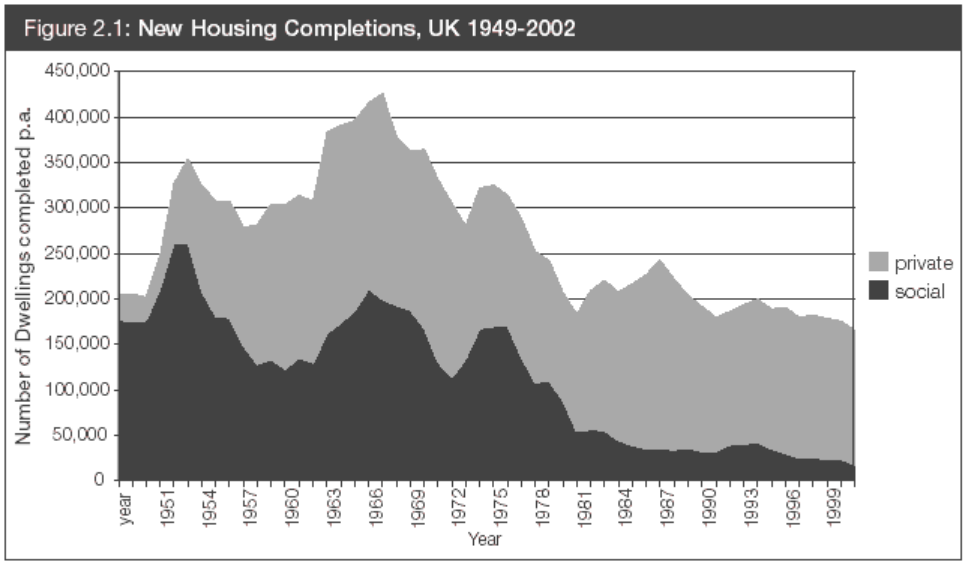
Average new-build garden size against market price in 2004

Blue dashed line shows the average new-build garden area in the 2004 study

Green dashed line shows the average garden size from the national survey published in 2008

The average new-build garden area in the 2004 study was only 113.4m^2, which is a third less than the 169 m^2 national average of all gardens in 2008, and only about 18% of the new-build gardens reached or exceeded this area. It would be good to have more up-to-date data on new-build garden area, but it is likely that the trend has strengthened.

New houses (with or without gardens) continue to be built, but at a lower rate than in the last century. Historically, home building decreased from peak rates post-war, and in the mid-1960s and 1970s. The strongest trend has been the decline in social housing built by local authorities and Registered Social landlords.



Reproduced from Homes for rural communities[10]

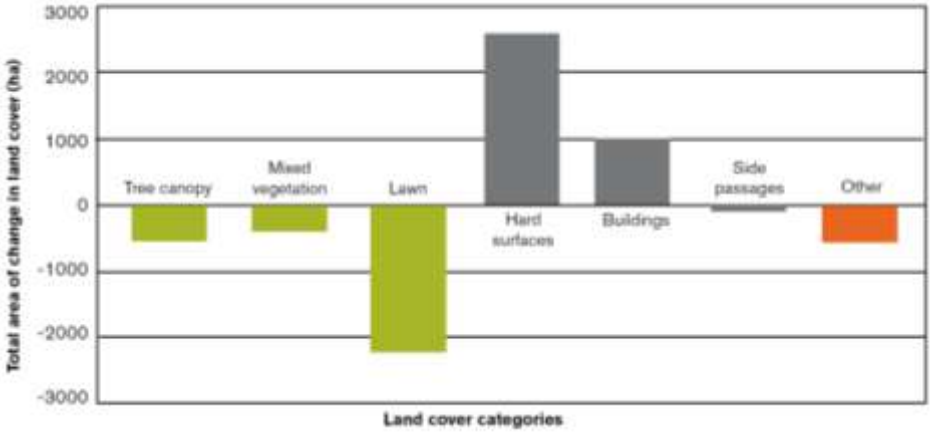
Latest available data indicate that at December 2013, house completion rates in England were running at the equivalent of 114,040 per annum[11], and 14,815 in Scotland[12]. These new homes are adding to the total area of gardens, but it is not clear if this is enough to balance out the loss of garden area nationally by various causes.

The downward shift in ownership of larger gardens has continued as this figure adapted from the Horticultural Trade Association's 2011 report[13] shows.

This is based on stratified samples of between 1000-2000 gardeners who have access to somewhere to grow plants. The proportion of people with communal or allotment gardens has increased, and the proportion of medium garden owners has decreased, although the differences are small.

Modern developments also impact on garden size by "garden grabbing", where a second house is created in a large garden, or a single old house and garden are bulldozed to build several small ones. People need homes to live in, but cities also need to be liveable, and the decline of green space is very worrying. In 2010, 25% of new homes in Britain were built on previously residential land, including back gardens, but the rate was three times higher in the Chilterns, where 71% of new homes were built on gardens, compared with 22% in 1997 and 55% in 2005[14].

Even when gardens are retained, the amount of green cover they hold is also declining. A very important study of London gardens found that there had been a 12% drop in the vegetated area of London gardens in the years between 1998-9 and 2006-8[15]. This equates to the remarkable statistic of losing 2.5 Hyde Parks per year.



The loss in tree, lawn and other vegetation cover was the result of an increase in hard surfacing, (such as patios, decking and parking areas), and sheds and greenhouses. Front gardens in particular had an average of 61% hard surfacing as paths and parking, and the loss of front gardens to the motor car is a common problem in older high density urban areas where garages were not part of the original design.

Look in the **Gardens and Urban Planning** section of the website to find more details about the changing garden and green infrastructure resource, and how they could be protected.

Garden Ponds

According to the 2001-2002 Survey of English Housing[2] , 10% of households had a pond, which works out at around 2½ million garden ponds in the country. The garden surveys suggested a higher proportion of 16%, giving a total of just over 3½ million garden ponds in UK gardens. Ponds averaged about 1m^2 in area, so if the higher total is correct, that is a total of 349 hectares of standing water. Windemere, the largest natural lake in England is only about four times this area.

A 2010 report[16] estimated that there were 478,000 countryside ponds in Britain (and this is only a third the number in 1880), so gardens hold 86% of Britain's ponds, but only a small proportion of the total area, since most garden ponds are much smaller than those in the countryside. But that small surface area is distributed over a large area, so nowhere in our towns and cities is far from the nearest pond. Most pond animals are also excellent colonists, so almost all ponds are used by aquatic organisms; they are a haven for amphibians, aquatic invertebrates and plants in residential areas, including some of specific conservation concern (e.g. the great crested newt, common frog and common toad). Garden ponds also provide drinking and bathing water for birds, as well as supporting a variety of invertebrates that are an important food resource for other animals.

Garden trees

On average, 54% of gardens contained one or more trees taller than 3 m. The average number of trees per garden was 2.4, giving us a national estimate of 28,730,986 trees within domestic gardens. One study looked specifically at tree cover in gardens, reporting that 11% of garden area was tree-covered, which translates to a national tree coverage of 47,402 ha. The area of the New Forest National Park is 56,600 hectares, but 10,000 hectares of this is heathland and mires, and there are large areas of farmland as well. In fact the total area of the New Forest ancient beech and oak woods is only 3,692 hectares.

There are about 123 million live trees outside woodland in Britain[17] so domestic gardens contain just under a quarter of the total number of trees outside woodland for the whole country. Trees in residential areas contribute to ecosystem services such as climate regulation and air filtration, and they also provide important habitats for wildlife. The Sheffield BUGS project, and other work, all confirm that the total volume of vegetation (to which trees make a large contribution) is a major determinant of the diversity and abundance of many taxonomic groups. Many urban trees are of course non-native, but such trees are far from useless for native wildlife[18].

Feeders and nestboxes

Around half of households with gardens also provide extra food for birds, while just under a quarter specifically use a bird feeder, which works out (conservatively assuming one feeder per garden) at more than 7 million bird feeders in UK gardens. A similar calculation suggests there are in excess of four million nest boxes in gardens.

Supplementary bird feeding is clearly of enormous importance; Britons spend £200 million per year on bird food, 12.6 million households supply food for birds, and 7.4 million specifically use bird feeders. Around half of Britain's breeding birds (about 70 million individuals) belong to species that commonly use bird feeders, so across the country, there is

approximately one feeder for every nine potentially feeder-using birds[1]. If all Britain's bird feeders were full, that would represent 2,580 tonnes of bird food, although it's generally reckoned that at any one time most bird feeders are empty. There are also about one nest box for every six breeding pairs of cavity-nesting birds in the country, and it is known that availability of nest sites can limit the density of such species[19]. It's easy to see why the density of birds in Sheffield, a fairly average large city, is more than six times the average bird density for the whole country[3].

Gardeners and wildlife

In a survey of gardens and gardeners in five UK cities[4], 60 % of gardeners made some effort to attract wildlife, for example by putting out food for birds, providing nest boxes, and growing what they believed to be 'wildlife-friendly' plants. Gardeners who tried to attract wildlife also saw more wildlife (or at least more species on a specific given list, mostly of birds and mammals), but whether this is because their efforts were effective, or just that they were more interested, is unknown. Gardeners who owned gardens with ponds also saw more wildlife.

Turnover of gardens

One problem limiting the ability of gardens to be useful for native plant conservation is that, like the houses they are attached to, they change hands frequently, and in addition they are subject to gardening fashion whims. The table below shows how long a large sample of householders with different tenure models had occupied their present property[20]

	Percentage of sample with various years of occupancy,								
Tenure	**< 1yr**	**1 - 2**	**2 - 3**	**3 - 4**	**5 - 9**	**10- 20**	**20- 29**	**> 30**	**Av.**
Owner-occupiers	3.7	4.2	7.4	10.2	19.8	21.5	16	17.2	11
Social renters	8	7.1	8.7	13.6	22	21.6	10.2	8.8	7
Private renters	36.5	17.5	12.4	12.7	10.3	5.2	2.1	3.4	1
All tenures	9.1	6.6	8.3	11.2	18.8	19.2	13	13.7	8

On average even owner-occupiers had only been in residence for 11 years, while the average length of residence for private renters was just a year. A 2006 estimate found that the average householder will move 6 times after buying their first property[21].

Every time a house and garden change hands, the new owner will make greater or lesser changes to the garden, often a complete new start. A garden managed carefully with wildlife in mind may be bought by someone who wants to turn it all over to vegetables, while flourishing ponds can be taken out because of safety concerns for young children. Animals can easily adapt to change by simply moving next door, but this isn't an option for most plants.

Gardening is very subject to fashion, exemplified by the wonderful oddities offered to view or to buy at the Chelsea Flower Show every year. If the must-have colour this year is purple, some trendy gardeners will adjust their garden wardrobe to suit. More seriously, the popularity of garden make-over programmes like Ground Force on the television encouraged a great trend for extensive areas of paving and decking, convenient for parties, but next to

useless for wildlife. Hopefully, as the world recognises that keeping decking safe and looking good isn't trouble free, some of this trend will be reversed.

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