The Nature of Gardens

OUR GARDENS CAN BE GOOD FOR NATURE
AND THAT'S GOOD FOR US

ONE PLANET HOME

B&Q

Contents


The
Nature
of Gardens

Our top ten tips to help garden wildlife, tailored for the UK.

For more information about our top ten tips to help bring wildlife closer to home, turn over to page 05.

Summary

We care about wildlife but most of us don't know how to help. Yet it's easy and rewarding to bring nature closer to home and everybody can do it.

Interest in, and concern for wildlife is almost a national characteristic. But as much as we are aware and concerned, most of us feel powerless to help.

Inspired by the *State of Nature 2016* report and to mark ten years of One Planet Home at B&Q we have dug into the potential for gardens to help everyone do something valuable and tangible in support of wildlife.

The *State of Nature 2016* shone a light on the fact that our own British wildlife remains under serious threat after decades of decline. Our specially commissioned review of the scientific evidence on gardens and wildlife by sustainability specialists and our long-term partner Bioregional shows that gardens are an increasingly important refuge for our beleaguered wildlife. And it shows that helping our local wildlife is far easier, more accessible and rewarding than most of us realise.

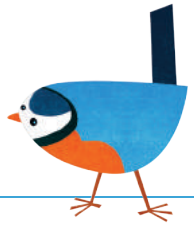
The UK is home to 24 million gardens, and many more outdoor spaces like balconies and door steps that can support wildlife and our own wellbeing. At B&Q we want to help people get the most out of their outdoor space. We believe that looking out for and welcoming nature into our gardens is key to that.

1/3

or more of the UK populations of house sparrows, starlings, blackbirds and greenfinches live alongside us in towns, cities and villages.

63%

of us believe that there are real benefits for ourselves in bringing more nature into our gardens.



Through a specially commissioned YouGov survey we learned that 64% of people are concerned about British wildlife. Our research has uncovered that gardens already accommodate thousands of species including 45 of the UK's priority species.

They provide significant habitat for several species in decline across the UK including the song thrush, starling, sparrow, common toad, hedgehog and stag beetle.

Most people are unsure about what they can do and those with smaller outdoor spaces feel particularly powerless.

83% of the UK population live in towns and cities, where gardens make up about a quarter of the total land area. Our gardens are tending to get smaller, increasingly covered in hard surfaces and at the same time we also want them to work harder for us. People said that they love to welcome wildlife into their gardens but few are confident gardeners, many are worried about doing anything that might harm nature and feel disheartened when they try things that don't work.

Taking action to support wildlife locally can have surprising benefits for us too. 63% of us believe that there are real benefits for ourselves in bringing more nature into our gardens - from the enjoyment seeing wildlife brings to the sense of having done something good for the environment.

In interviews people talked about the educational value and real sense of wonder and fun connecting with nature delivers for children. In particular people want to see more birds (71%), pollinators (59%) and hedgehogs (59%) in their gardens.

And our review of the scientific evidence confirms that the benefits of connecting with wildlife are extensive from better educational attainment, a better sense of wellbeing and better long term mental and physical health. But people also claim that a lack of time (24%), money (23%), knowledge (23%) and space (22%) prevents them from doing more to bring wildlife to their gardens.

1 in 5 people with small gardens say they are doing nothing to support wildlife. Given that small gardens are the most numerous, it is vital that we mobilise people into action. We hope that this report will highlight the real value our patchwork of gardens could provide for wildlife, and that our list of carefully developed tips to get started will show how quick, affordable, easy and rewarding small steps can be.

Making our outdoor space more appealing to nature by providing places to shelter and breed as well as to forage and feed is remarkably easy to do. It seems that the more you look and do, the more you will find and the happier and healthier it can make you.

B&Q's Simple Steps to Bringing Wildlife Closer to Home.

1. Look out for wildlife & share your discoveries

- Becoming a citizen scientist by taking part in wildlife surveys is a great free way to become more aware of what's already out there.
- The more you talk about what you are doing, what you have seen and encourage others to join in the more fun it becomes.

2. Pop up a bird café

- Offering food and water is the fastest and easiest way to attract new visitors to your space.

3. Plant for pollinators

- Nothing says summer like the sound of bees buzzing and the sight of butterflies – fragrant flowers in a pot or a bed are an irresistible addition.

4. Give wildlife some shelter

- A log pile is great for butterflies, bug houses provide homes for mini beasts, a leaf pile for hedgehogs or install a bird or bat box – for best results make sure you are careful with positioning.

5. Get nature savvy with your shopping

- Use fewer garden chemicals.
- Look out for pollinator-attracting plants.
- Insist on forest friendly wood and peat free composts to help nature near and far.

6. Just add water

- A pond can be any size, even a buried bowl can provide a home for various mini-beasts and insects like damsel flies.
- Constructing a pond using a preformed shape or flexible liner will give much greater variety. Create shallows so that plant life can flourish and allow wildlife to enter and leave. *If you have small children, wait until they are older before creating a pond.*
- A bird bath provides water for birds to bathe and drink.

7. Max out the green

- Nurture what trees and shrubs you have and bring more in wherever possible. Nature needs habitats at all levels so trees are fabulous but climbers are super space efficient.

8. Help wildflowers flourish

- Plant a mini meadow in a pot, wildflowers in your borders or just spare a patch of lawn to let the grass and flowers grow long.

9. Open hedgehog gateways at the bottom of your fence

- One of our most loved species, hedgehogs love to roam, but fencing can be a barrier. Creating a gateway either in or below your fence will make life easier for them.

10. Make your cat safe and seen

- The UK is home to 7.5 million cats. Cats can be a threat to wildlife but a bright collar and bell can reduce risk, as can keeping them indoors from one hour before sunset until one hour after sunrise.

Introduction

People versus nature. That story of conflict lies at the heart of all our concerns about the environment, sustainability and the future of our one shared planet.

A growing human population combined with an expanding global economy is doing more and more harm to the earth's life support systems on which we and all living things ultimately depend.

Yet in one ordinary, utterly familiar space, very close to home, there is a different and far more hopeful story to be told. Our household gardens are an increasingly important refuge for the UK's beleaguered wildlife which continues to decline, despite decades of growing concern. They do good for nature but, just as importantly, gardens are the prime locations where nature does good for us. Animals and plants, the changing skies and passing seasons, a medley of natural sights and smells and sounds, are all right outside the back door for tens of millions of us.

Gardens help to relax and destress us and to inspire and uplift us. They can engage us with the natural world from hour to hour and season to season, helping us to become more aware and better educated about nature and better planetary guardians as a result.

This report summarises the latest evidence on gardens and wildlife in the UK, drawing on extensive scientific research. It looks into why and how our gardens are good for plants and animals, and how they compare with those bigger spaces which people think of as prime habitat – nature reserves and the countryside. It considers how gardens are gradually changing, what challenges they present for wild species and how we could manage them to deliver greater benefits for wildlife.

This report also examines why gardens are good for us and how they can help us to become better stewards of our finite planet. It draws on new quantitative and qualitative consumer research commissioned by B&Q, the UK's leading home improvement and garden living retailer. This examined people's attitudes towards supporting and engaging with wildlife and the environment, seen through the lens of their gardening, with a focus on what prevented them doing more. Findings from this research are summarised in the Appendix and referred to in the report. Comments made by interviewees during the qualitative research also feature.

Rachel Bradley
Sustainability Manager, B&Q PLC

Nicholas Schoon
Bioregional's Policy and Communications Manager

It's easy to feel a bit powerless when it comes to saving the planet. For individuals and families, problems like deforestation and climate change can look overwhelmingly large and complex. But we can all do something to protect nature right outside our own homes.

Rachel Bradley commented "At B&Q, we've been helping people to support wildlife in their gardens for years, through advice and products ranging from pollinator-friendly flowers to pond liners. But until we commissioned this report we didn't realise quite how important our gardens could be for nature. And while we've always known that people love connecting with nature in their gardens, we're delighted to find so much evidence that garden wildlife and greenery is good for people in so many different ways.

We want to help everyone to do a bit more to support nature right outside their homes, and to enjoy it more too. That's the aim of our top ten tips. It's easy and affordable and you don't even need a garden – you can green up a balcony or a doorstep."

B&Q commissioned its long-term sustainability partner Bioregional to research and write this report. Bioregional is a charity and social enterprise which champions a better, more sustainable way to live, working with partners across the globe to create better places for people to live, work and do business. It helped B&Q develop its award-winning One Planet Home programme in 2007 and has been working with the company ever since, helping it to realise its sustainability ambitions. More information at **www.bioregional.com**.

The author is Nicholas Schoon, Bioregional's policy and communications manager. He was the environment correspondent of The Independent newspaper for eight years and wrote *Going, Going, Gone*, a book about threatened UK wildlife. He has also edited a journal and website for environmental professionals and served as a policy analyst for the UK's Royal Commission on Environmental Pollution. A long time ago he gained a degree in zoology at Oxford.

Thank you

We are grateful to four leading organisations in wildlife conservation and gardening for reviewing our report and helping to improve it.

RSPB

"Our gardens are incredibly important for wildlife. Each green space can make a difference, from a window box full of pollen rich plants for bumblebees to a small pond hosting a whole range of different species. The RSPB is calling on people to help save nature by getting involved in Giving Nature a Home, and doing at least one action for wildlife in their garden, outdoor space or beyond."

rspb giving nature a home

Butterfly Conservation

"This report provides a timely and encouraging summary of all that's great and good about our gardens - but it also serves as a reminder about where we have been losing our way with applying too much control in gardening. With urban butterfly numbers falling by almost three quarters in the last 20 years, it's time to put into practice some of the fantastic advice in this report and to nurture our gardens as wildlife havens for everyone to enjoy".

Butterfly Conservation
Saving butterflies, moths and our environment

Royal Horticultural Society

"As the largest UK gardening charity the Royal Horticultural Society (RHS) is really pleased to see a retailer taking a leadership approach to safeguarding wildlife through this report. With the increasing pressure on our natural environment and our growing urbanised population there has never been such an important time for gardeners to help wildlife thrive and for their gardens to act as additional refuges for nature. There also some health benefits for us too!

With around 400,000 garden plants, more than 22 million gardens and half of the population actively gardening we can all really make a difference by providing connectivity, food, and shelter for wildlife.

This potential can be unlocked by getting involved in gardening for wildlife through Greening Grey Britain (**www.rhs.org.uk/science/gardening-in-a-changing-world/greening-grey-britain**) and through growing plants that are perfect for pollinators (**www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators**)".

Royal Horticultural Society
Sharing the best in Gardening

The Wildlife Trusts

"This is an excellent report which we support and can recommend. There are reasons to be cheerful. The evidence is overwhelming: Gardeners can and do make a major contribution to wildlife. And by taking a few simple, cheap and easy steps we can make our gardens even more friendly for wildlife. What's more, it also does us good and can provide endless pleasure."

THE wildlife TRUSTS

Maxing out the green by planting upwards and being a **nature savvy shopper** with responsibly sourced timber products, peat free compost and low chemical use can make even the smallest spaces wildlife friendly.


The garden habitat
and how it is
CHANGING

Replacing some hard paving with pro pollinators planting and permeable surfaces is an easy way to attract pollinators, bring colour and allow water to drain away.

There are 28.5 million homes in the UK[1], and about 24 million of those have a garden[2] with an average size of 190 square metres, approximately three quarters the area of a tennis court.[3]

In total, domestic gardens cover an estimated 2-3% of the total surface area of the UK, or some 500,000 hectares - about the same size as Norfolk.[4] The great majority of this garden space is found in our towns and cities.

In fact, about half of the total area within towns and cities has no buildings or hard surfaces on it. Much of this green urban land consists of parks, golf courses, woodlands, cemeteries, playing fields and land verging roads, railways, rivers and canals. Some of it is so-called 'brownfield land', once developed but since cleared and left idle. About half of the total consists of private gardens, so roughly a quarter of towns and cities consists of gardens.[5, 6]

The half a million hectares or so covered by these millions of gardens is small compared to the countryside in its entirety. But if we think of them as mini nature reserves then they become a surprisingly significant national resource.

Their total area is about a fifth of the 2,594,000 hectares of land and freshwater in the UK given legal protection for wildlife and habitat conservation.[7] However, the great majority of this protected, officially designated land (which covers nearly 11% of the UK's total land mass) is found outside of towns and cities. In contrast, gardens provide space for nature in the places where the great majority of the human population live. Furthermore, they provide habitat amid a harsh and hostile environment; without gardens and the other urban greenspace wildlife and plants in built-up areas would be a tiny fraction of what it is now.

What is happening to our gardens, taken as a whole? Even though the total number of homes is gradually increasing, which should push up the total number of gardens, there are three deep-seated trends which are making gardens less useful for wildlife.

Over the past quarter century new homes have tended to become smaller, with correspondingly smaller gardens. A Joseph Rowntree Foundation study of more than 600 new homes found their average garden size was 113m^2, 40% smaller than the average across all homes.[8] Meanwhile the proportion of new homes which are garden-less flats rather than houses has also risen, from 18% in 1996 to 26% in 2016.[9]

2-3%

of the UK's land surface is covered by gardens, an area the size of Norfolk.

About three quarters of new homes are built within towns and cities. While many of those come from redevelopment of demolition sites and building conversions, an estimated third of these new urban homes are being built on urban greenspaces. Latest government statistics show 5% of all new homes in England are built on existing gardens, some 7,000 a year.[10]

All three trends reflect a combination of high house and land prices and strong planning restraints on building new homes in open, undeveloped countryside. Housebuilders and planners have reached for the obvious solution – build smaller homes at higher densities.

Ex-industrial 'brownfield' sites which can be rich in wildlife, along with playing fields, gardens and other urban green spaces, are chipped away by developers. A few households gain big windfalls by building new homes in their gardens. Housing densities are ramped up while gardens are minimised or eliminated in new developments.

The green spaces within cities are gradually eroded by new development of all kinds. The same is true of the wider countryside. Each year, the total UK area of previously undeveloped land that is built-up or built-on grows by about 10,000 hectares – equivalent to a new town of some 400,000 people. The supply of small new gardens that comes from new house building does not begin to make up for this loss.

In addition, there is the loss of habitat caused by developers, homeowners and landlords covering part or all of their gardens with hard surfaces. In doing so they reduce the area of soil available for plants, which underpin nearly all ecosystems and food chains. They also reduce the ability of urban areas to soak up heavy rainfall. This increases the risks of surface water flooding and of watercourses being polluted by storm sewer overflows.

This paving and decking-over of gardens has been significant. One detailed study of a Leeds suburb found a 13% increase in the area of impervious surfaces in gardens over a 33-year period.[12] The biggest contributor was paving over front gardens, mainly done to provide car parking space. A larger, more recent survey of Greater London found a 26% increase in the total area of hard surfaces in gardens over just nine years and a fall of 12% in their total vegetated area.[13]

The Royal Horticultural Society (RHS) is fighting this trend through its 'Greening Grey Britain' campaign. It commissioned surveys which found that between 2005 and 2015 the proportion of UK households saying their front garden was entirely paved over rose from 8% to 24%.[14]

The recent and marked fall in home ownership caused by high property prices is also likely to affect how gardens are managed. The RHS has argued that tenants and landlords are unlikely to invest as much of their time and money in their gardens as homeowners.[15] If more gardens are left to grow wild and unkempt as a result of this trend, then garden wildlife may conceivably benefit. But the opposite may be the case if tenanted gardens are paved over or simplified and harshly controlled.

So while our gardens may be an important resource for nature, wildlife and people in one of the world's most urbanised and densely populated nations (see box), there are some trends working to reduce their potential. But there are also grounds for hope.

Our gardens can provide valuable support to our beleaguered wildlife.

83%

of the UK's population are housed in towns and cities.

4.5 MILLION

front gardens (1 in 4) are completely paved over.

OUR GARDENS

occupy about a quarter of the total area of towns and cities, making up half of their green spaces.

26%

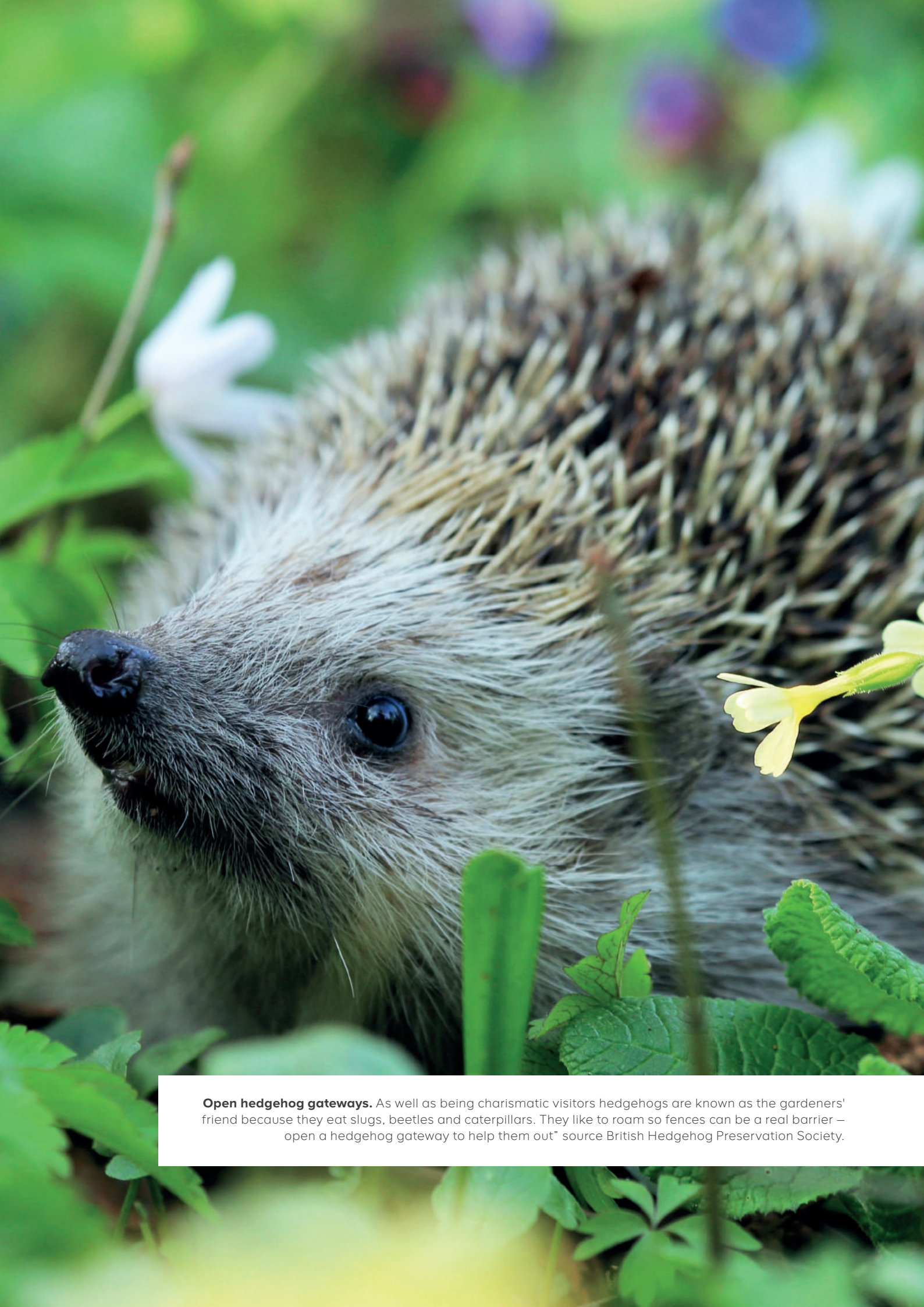
increase to the total area of hard surfaces in gardens over just nine years in Greater London.

HOW URBAN IS BRITAIN?

The UK's population density, at 269 people per square kilometre, is among the world's highest, exceeded only by the Netherlands, Belgium and Malta within Europe.[16] England's population density is much higher still at 413, higher than that of China, India and Japan and second only to tiny Malta and the Netherlands within Europe.

With 83% of the UK's population housed in towns and cities the great majority live at densities which are 10 – 100 times higher than that, making gardens and other urban green spaces a precious resource.[17]

Estimating the UK's total area that is urbanised is difficult because a large part of towns and cities are not actually covered in buildings and hard surfaces and the border between town and country can be hard to define. Even so, the green areas within towns and cities, including gardens, belong to the total urbanised area rather than to the wider countryside. On that basis almost 12% of the UK's total land surface is urbanised, according to the most recent UK National Ecosystem Assessment and Office of National Statistics Land Cover Accounts.[18]



Open hedgehog gateways. As well as being charismatic visitors hedgehogs are known as the gardeners' friend because they eat slugs, beetles and caterpillars. They like to roam so fences can be a real barrier – open a hedgehog gateway to help them out" source British Hedgehog Preservation Society.

Reasons to be CHEERFUL

There is a wealth of evidence showing that millions of people in our crowded, highly urbanised nation want their gardens to support wildlife and are willing to invest their own time and money in that cause.

More than half a million people counted more than 8 million birds in the RSPB's Big Garden Birdwatch in January 2017, the 38th year this hugely popular weekend-long event has run.

One scientific survey estimated about half of all UK households put out food for birds in their gardens, with 28% - or 7.4 million – using bird feeders.[19] There were an estimated 4.7 million bird boxes in UK gardens while the number of garden ponds was put at 2.5 to 3.5 million – many more than the 500,000 or so lowland ponds remaining in the countryside.[20] There are other common garden features and techniques widely recognised as supporting wildlife that are found in millions of UK gardens; having a compost heap, a bird bath, or a pile of decaying logs; letting a small part of the garden run wild.

Only in the past 100 years did Britain become sufficiently urbanised and then suburbanised for most of its predominantly urban population to have its own garden. Wanting access to a portion of nature right next to the home is one of the main reasons why the UK became a nation of gardeners.

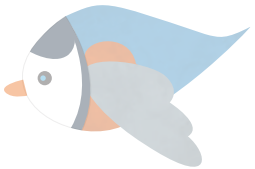
Today numerous books have been written on wildlife-friendly gardening, some of them by celebrity television gardeners and naturalists such as Alan Titchmarsh and Chris Packham. Media articles and programmes about gardening often cover the subject. Big conservation and gardening NGOs such as the Wildlife Trusts and the Royal Horticultural Society have plenty to say about it, run major campaigns and provide a great deal of free advice to the public.

The RSPB, with more than one million members, now leads its membership recruitment with a wildlife-friendly gardening campaign ("Give nature a home in your garden") because it sees this as the most powerful way to connect ordinary people with protecting birds.

Scientists have also become increasingly involved with UK research council-funded projects trying to understand the ecology of why and how our gardens are good for wildlife. Key findings are summarised in this report. 'Citizen science' - volunteers gathering data about wild animals – has long been important in research into wildlife in gardens, particularly concerning birds. Scientists are increasingly interested in making use of these volunteer observers; they can help gather large quantities of useful information quickly and cheaply while educating people about nature and reinforcing or deepening people's concerns for wildlife.[21,22] Participation in garden wildlife surveys such as the Big Butterfly Count and the Big Garden Birdwatch has the potential to help conserve threatened UK wildlife.

ABOUT HALF

of UK households feed wild birds in their gardens.



What is WILDLIFE-FRIENDLY gardening?

This simply means managing gardens in ways that benefit wildlife, helping to conserve or even increase the UK's biodiversity. It can be divided into three different approaches which overlap and complement each other.

A small minority of garden owners or managers take wildlife-friendly gardening very seriously and set out to create a garden mainly dedicated to wildlife. They think and research in depth about how to do this. These gardens can be beautiful and colourful as well as wildlife-rich but creating them requires expertise, dedication and significant resources of time if not money.

The second approach is based on community gardening. This involves the creation of habitat that aims to support wildlife and plants in public or communal spaces such as parks, school grounds and the shared outside area of housing estates. These green spaces can be combined with children's playgrounds, recreation areas and allotments. These initiatives can increase community cohesion, social capital and people's wellbeing while supporting wildlife and beautifying the public realm.

The third approach is the focus of this report. It concerns the type of wildlife-friendly gardening that almost everyone with a garden can do. It recognises that while there is widespread public support for our gardens supporting wildlife, most people require their own garden to do much more. It is a place for their children to play and their pets to roam. They want beautiful, colourful flowers and plants thriving in their garden, or to grow their own fresh, wholesome food. They want to be able to sit or lie out, barbecue, eat and entertain in the sun and fresh air. They may need a shed to escape to or a well-striped lawn to display.

Given that the great majority of households need their gardens for various non-wildlife purposes and have limited resources and garden space to devote to wildlife, how much use can they be to wildlife? How can they be managed to better support wildlife? And how can conflicts between these other uses and wildlife be reduced?

6 X MORE PONDS

in our gardens than are left in the lowland countryside.

Why gardens ARE SO GOOD for wildlife

The most celebrated study of garden wildlife is the 30-year investigation carried out by the zoologist Jennifer Owen in her suburban garden in Leicester.[23]

Between 1971 and 2001 she found a huge variety of life with a total of 2,673 plant and animal species recorded, the great majority of them invertebrates. Across all of the different taxonomic groups she covered, an average of 9% of all the species known to live in the UK were identified. For example, she observed 54 different bird species in her garden.*

Tracking down all of these different plants and animals, many of them obscure and tiny, was an impressive feat of dedication and endurance for Dr Owen and her fellow scientists – all the more so given that it was done without any formal research funding. She even discovered four species of parasitic wasp that were new to science.

But there was nothing particularly special about her garden to grant it this rich variety of life. True, it was on the large side – nearly four times the area of the UK average of 190 square metres. And she shunned the use of pesticides and avoided excessive pruning and tidying up. But her garden was no nature reserve; it was managed like an ordinary suburban plot with lawn, flower beds, shrubs and a vegetable garden. Subsequent research has found nothing to suggest her garden was especially biodiverse compared to the usual run of suburbia.

So how does this biodiversity of ordinary gardens compare to that found in the UK's prime natural or semi-natural habitats or the ordinary countryside? "Pretty well," is the quick and easy answer, although the question turns out to be a difficult one. How many species you find in any area depends on how large the area is (as area increases so, generally, does the number of species), how long and hard you look for species, exactly what you look for (how many different taxonomic groups) and how good you are at identifying what you find. There are very few studies of similar depth and length to Owen's.

However, one that does stand comparison has been carried out by the Natural History Museum in Central London. In 1995 the museum created a wildlife demonstration area open to the public in one corner of its South Kensington grounds. Here it aimed to reproduce small patches of characteristic UK habitats such as chalk downland, fen, lowland heath and meadows and woodland. The museum has used its world-leading expertise in species identification to keep a record of the plants and animals found in this 1.8 hectare green area, which is open to the public. Many of these species arrived when patches of habitat, such as downland turf, were first brought to this large inner-London wildlife garden but many more have since made their own way there. More than 20 years on, some 3,000 species have been identified. This is slightly more than Owen found in her very much smaller garden, with less scientific expertise available to help her identify species.

*Many of the flying insects and some of the birds found in her garden were passing through and would not have been using it to feed and breed.

Another study of 267 gardens in Belfast, Cardiff, Edinburgh, Leicester and Oxford found a total of 1,056 plant species (Owen found 474 in her Leicester garden). This study also looked at five other semi-natural non-garden habitats (such as acidic grassland and scrub) using quadrat surveys. In these, small rectangular frames are laid on the ground at random locations within the habitat and the number of different plant species found within each quadrat is counted. The more quadrats that are laid, the more species are recorded – though the numbers eventually start to level off to a saturation point where all of the species have turned up in at least one quadrat. Once 100 quadrats had been laid down, more plant species had been identified in the Belfast and Leicester gardens than in any of the non-garden habitats which were studied, including limestone grassland, the most biodiverse of them.

So it appears that ordinary gardens can harbour as great a variety of life as other habitats in the countryside, and a greater variety than intensively cultivated arable landscapes.[25]

29 MILLION TREES

grow in our gardens, nearly a quarter of all trees found outside UK woodlands.

267 GARDENS

in Belfast, Cardiff, Edinburgh, Leicester and Oxford were found to have 1,056 plant species.

VEGETATION

in our gardens helps to reduce air and noise pollution, reduces flood risks and lowers temperatures during heat waves.

The ways in which gardens support wildlife

To begin with, gardens work for wildlife by providing the basic resources found in ecosystems – food and water, shelter and refuge. The most obvious and common wildlife-friendly garden activity is to feed wild birds. We do this on such a huge scale that it is changing the population, the behaviour and probably the evolution of several species.[26,27] For example, recent British Trust for Ornithology (BTO) research has found that large numbers of blackcaps now migrate from central Europe to the UK in winter instead of southern Europe, thanks to a combination of bird feeders in gardens and milder winters associated with climate change.[28]

But gardens have more to offer wildlife than feeders and bird tables. They provide abundant space for plants to grow so that complex local food webs can be created with primary plant producers, herbivores, predators and parasites (which do not generally kill their hosts) and parasitoids (which do). Gardens have been estimated to contain 29 million trees, nearly a quarter of all the trees found outside of UK forests and woodlands.[29]

Importantly, gardens provide a variety – or mosaic - of habitats vertically and horizontally by having trees and shrubbery as well as lawns, flower beds with annuals and perennials and vegetable plots. The patches of different habitat that gardens provide and the diversity of conditions found in them – in the amount of shading from sunlight, humidity levels and shelter from wind – encourages diversity in plants and animals. To some extent gardens can mimic woodland glades and woodland edges, offering sunshine and shelter from wind. Some of the butterflies that breed in UK gardens such as the Speckled Wood and the Holly Blue are associated with woodland clearings. The hedgehog, perhaps the most characteristic garden mammal, is a creature of hedgerows and woodland edges in the countryside.

Garden ponds provide aquatic habitat and drinking water for terrestrial animals and, along with the garden watering which keeps plants alive and producing nectar, may become important for some wildlife during droughts. Soil, dead wood and rotting vegetation bring in further complex communities of invertebrates, fungi, bacteria and other organisms which decompose these materials.

There is more. As Owen recognised, gardens usually have a highly unnatural diversity of plants because gardeners seek variety and plant non-native species. This diversity mounts up when groups of neighbouring gardens are considered; wildlife rarely confines itself to individual gardens. A greater diversity of plant species can boost diversity further up the food webs.

The additional warmth which comes from the urban 'heat island' effect found in larger towns and cities may allow some plant and animal species to flourish at latitudes which would usually be too cold for them in winter. But canopy vegetation in urban areas, much of it in gardens, can also help to lower temperatures during heat waves, benefiting people as well as wildlife. The additional plant growth which comes from natural and artificial fertilisers used in gardens can also boost the abundance of plants, if not their diversity.


How gardens can fail to support WILDLIFE

While ordinary gardens may be home to a surprising diversity of life, we should be realistic about their ability to support wild species and understand their limitations.

For some plant and animal species they are challenging or useless as a habitat.

Gardens are often exposed to noise and light pollution, and while the impacts on wildlife are uncertain, there is evidence that they are detrimental for some birds and animals using our gardens.[30,31] Urban air quality, despite improving over the past 50 years, remains compromised by pollution although the picture is complex and here too the impacts on plants and animals are not well understood. Some types of air pollution such as high ozone levels can extend across the entire country and others such as particulates and nitrogen dioxide are at their highest close to the busiest urban roads.

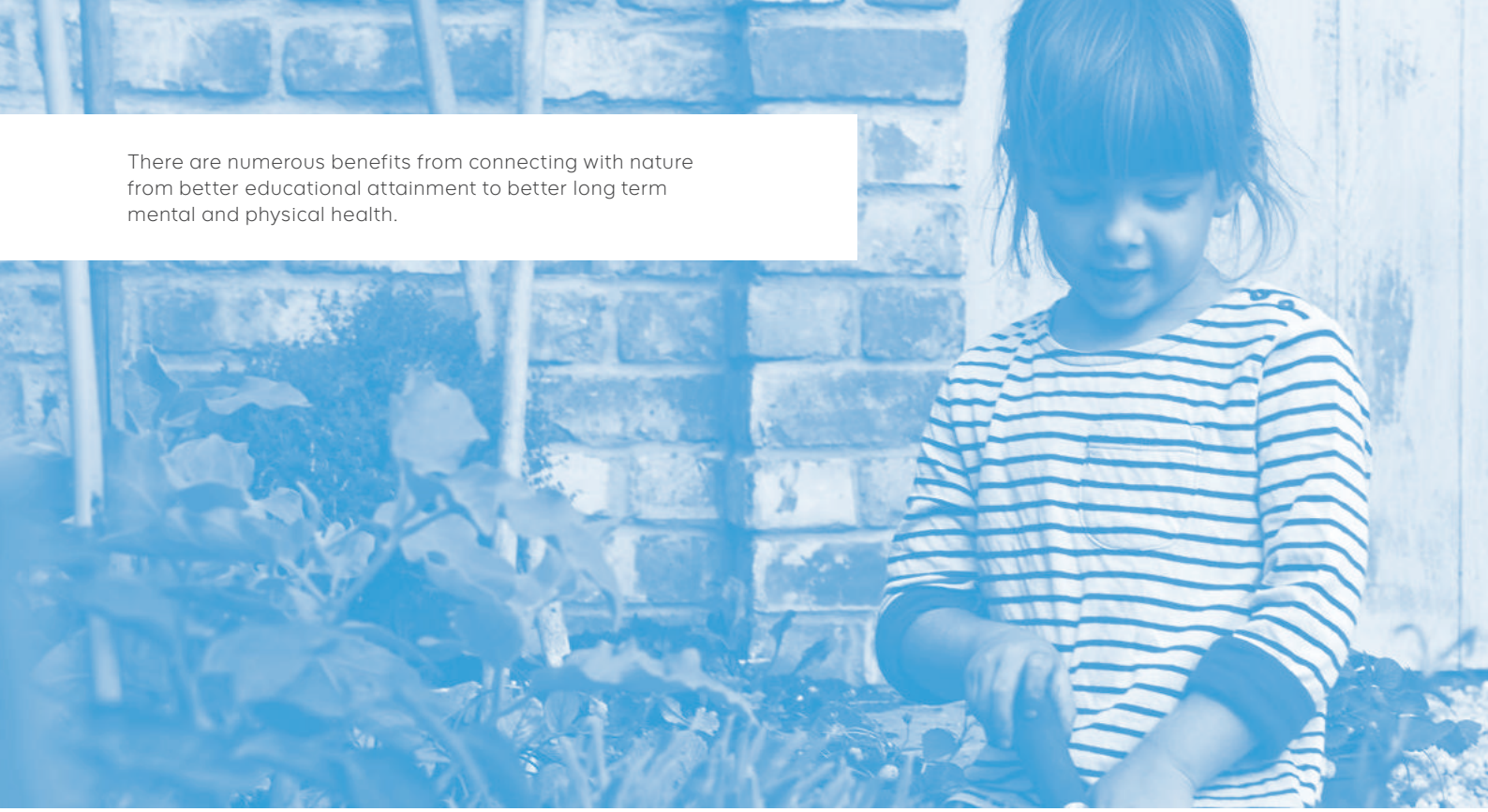
One in three front gardens now have no plants growing in them.

159 DIFFERENT

plant species found in the lawns of 52 Sheffield homes.

NEW HOMES

generally have smaller gardens, or no gardens at all, compared to older homes.



There are numerous benefits from connecting with nature from better educational attainment to better long term mental and physical health.

Disturbance by humans and pets is also a significant issue, with some bird species taking flight or never nesting when people come close.[33] Dogs can deter or disturb birds, mammals and amphibians, notably hedgehogs. Scientific studies around the world have shown that domestic cats kill large numbers of birds, small mammals and reptiles, with recent studies in Bristol[34] and Reading[35] finding that on average each feline kills about 20 small mammals (mostly wood mice) and birds each year. It may be that many of the birds killed by cats are fledglings which were unlikely to ever reach breeding age. And only a small proportion of cats may be responsible for most of the kills, with the remainder killing few or none. Prey species have evolved to cope with predation, but having high densities of cats maintained by humans feeding and sheltering them can create an unnaturally high level of predation. Some scientists conclude pet cats can significantly lower wild bird populations in towns and cities.[36]

There are other reasons why gardens can be significantly compromised as wildlife habitat. Digging over soil, removing dead wood and plants and heavily pruning back climbing vegetation will be harmful to some species and may reduce overall biodiversity in the garden.

Herbicides and pesticides are bound to kill some wild plants and animals; that is what they are designed to do. Artificial and natural fertilisers will also be harmful to those wild plant species which require the kind of low levels of soil fertility rarely found in gardens.

Lawns, the single largest type of ground cover in gardens, are particularly challenging because most gardeners mow them frequently and fairly short and seek to reduce the number of weeds. That reduces the quantity and diversity of food gardens can provide and the abundance and diversity of plants and animals that can use them.

Even so, every gardener knows that plenty of birds spend plenty of time finding food on lawns. And it is never easy to ensure only grasses grow in them; one study of 52 gardens in Sheffield found 159 different plant species in their lawns, mostly non-grasses and mostly UK natives.[37] The big question is – can we let some of our lawns grow longer and become more species-rich in order to benefit wildlife?

Gardens are also a fragmented habitat, with physical barriers between them. While birds and many flying insects can easily cross walls and fences, some animals – such as hedgehogs, frogs, toads and even some butterflies – may find it more difficult. Many animals need to exploit an area much larger than the average garden to find food, water, mates and breeding sites. To do that they may have to cross terrain which is barren or hostile, such as roads, pavement and buildings. The only way to reduce this inherent problem is to ensure that urban developments of all kinds, whether they are built on open land or fitted onto previously developed sites within towns and cities, are planned with wildlife in mind. So pressure needs to be placed on developers and council planners to ensure that new construction and redevelopment increase the amount of urban green infrastructure.

There are several other ways in which gardens are potentially harmful for wildlife.

“...I haven’t read anywhere about how important it is or how easy it is to support wildlife. I was just born into it. It was the way I was raised and how I want to raise my daughters.”

LOUISE
MOTHER OF TWO, READING

Feeding birds can help diseases to spread both within and between species, since it brings large numbers from a range of species into close proximity around feeders. Garden bird feeding and bird baths have been implicated in the spread of salmonellosis (caused by salmonella bacteria), avian pox (a viral disease which spread through great tits, blue tits and coal tits in South East England from 2006)[38] and trichomonosis. The latter, caused by the protozoan parasite Trichomonas gallinae, spread from pigeons and doves into chaffinches and greenfinches in the UK around 2005, killing a substantial proportion of both populations – one estimate has greenfinches falling from 4.3 million to 2.8 million in a few years.[39] The RSPB and BTO have both issued advice about cleaning and disinfecting bird feeders and baths.[40]

The globalised horticultural and nursery trade, much of it ultimately serving domestic gardens, has also brought in novel pests and diseases and invasive species which spread through the countryside and harm wild plants and animals.

Arthurdendyus triangulates, a flatworm imported into the UK from New Zealand more than 50 years ago, feeds exclusively on earthworms. It has become widespread in Scotland, Northern Ireland and northern England having spread between gardens and nurseries by transfers of soil, compost and rooted plants and is now established on a few farms.

Another example of a harmful invader is the Spanish bluebell, introduced by the Victorians and now common in UK gardens. The Spanish species grows more vigorously than the UK’s native bluebell, which has narrower leaves and darker, more strongly coloured flowers with a distinct scent. The almost odourless Spanish species readily hybridises with the native, which means that this beautiful icon of spring could gradually be displaced through UK woodlands. Hybrids are already common in woodlands near urban areas.

The Spanish bluebell is on conservation charity Plantlife’s “dirty dozen” list of 12 invasive non-native plants doing harm to UK habitats and wildlife species.[41] All were introduced through gardens, so if these invaders are ever to be eliminated that will depend on the support of gardeners and the gardening trade. In 2014 five invasive water plants were banned from sale in England having choked miles of river and canal.

Finally, there is the wider environmental damage gardens can do through fossil fuel consumption and the air pollution and climate change this causes, and by using irreplaceable or over-stretched natural resources. Gardeners could reduce this harm by:

- Not using any peat-based composts. Horticultural peat comes from a wildlife-rich habitat which takes thousands of years to form and should be no longer be exploited.
- Limiting their use of fossil fuels in the garden – via electrically powered tools and appliances (about half of UK grid electricity is generated by burning gas and coal) and those that use petrol. But note that a garden with growing trees and shrubs and increasingly rich and deep soil is a carbon sink, removing carbon dioxide from the atmosphere.
- Minimising or eliminating the use of tap water for garden watering. Large amounts of energy are used to process and pump drinking water, while over-abstraction from aquifers is reducing river flows during dry spells, harming aquatic wildlife. With almost half of UK homes having a water meter, tap watering is also expensive. Far better to collect rainwater in water butts; it is free of charge and helps to prevent storm sewage overflows. Or even to recycle ‘grey water’ from sinks and baths after long, dry spells when the butt is empty.


Why
wildlife
IN GARDENS
is good
for us

Children are more active in the same area of space outdoors as they are indoors.

Nature is good for us. In a society in which most people live in towns and cities and spend most of their time indoors, those who are more connected and exposed to nature are generally healthier and happier.

Numerous peer-reviewed scientific studies indicate that interacting with nature helps us avoid or recover from illness and improves mental wellbeing and our ability to think.[43]

To understand why gardens are good for us we need some understanding of what it is about nature that is good for people. This is hard to pin down because 'nature' is many things. The sight of sky and clouds, sun, moon and stars and distant views of hills, plains and water. The feeling and sound of wind. The sense of seasons passing, soft green shapes of plants, the colours, smells and noises that go with living things and natural landscapes.

Our response to nature is equally complex – from feelings of deep calmness and relaxation to excitement, exhilaration and intense curiosity. Much of the benefit of nature may stem from the fact that it gives us places and spaces where we enjoy physical exercise, critical to good health and mental wellbeing.

Harvard professor E O Wilson, one of the world's greatest living biologists, has proposed that 'biophilia' is a deep human trait. He defines this as "the urge to affiliate with other forms of life." Evolution, he argues, has left us with a subconscious drive to seek connections with living things and systems beyond our own species – animals (both companions and wildlife), plants and natural landscapes. This all-pervading biophilia transcends our fears of nature (snakes, large predators, insects with black and yellow warning stripes) and our drives to exploit it (by hunting and gathering food). Fulfilling our drives for such things as human company, mental stimulation and self-esteem is generally good for us; the same applies for a dose of nature.

The biophilia hypothesis has stimulated much research. The biggest questions scientists are trying to answer can be summarised as:

- How can the health and wellbeing benefits of exposure to nature be detected and measured? What are the mechanisms?
- Why and how do people relate to nature and living things and come to feel attracted or connected to them? How much does this vary between people?
- If we are inclined to be attracted to nature, why do our societies often damage and destroy it? Why do many of us lead lives increasingly divorced from natural surroundings?
- Do people who feel more connected to nature have stronger environmental values, attitudes and concerns, and does this then translate into pro-environmental behaviour and actions.[45]
- What part does experience play in determining how strongly people feel connected to nature, both as children and as adults?

Answers are emerging. In 1984, the year that Wilson's book about biophilia came out, a pioneering and oft-cited paper was published which showed that patients recovered more quickly after an operation if their hospital window gave them a view of a natural setting rather than a brick wall.[46] They also needed fewer painkillers. Since then, dozens of scientific papers have shown a wide range of benign effects on mental and physical health from exposure to nature.[47]

One recently published example comes from a study of 263 people in Milton Keynes, Luton and Bedford carried out by scientists at the Universities of Exeter and Brisbane and the BTO.[48] They found that residents self-reported lower levels of depression, anxiety and stress using an online questionnaire in neighbourhoods with higher levels of vegetation cover. And the numbers of birds recorded locally in the afternoon was also linked with improved mental health. Urban bird counts are usually done early in the morning, when birds are most abundant, but recording their numbers in the afternoon tallies better with how many birds people actually see outside their homes.

The proposition underlying this kind of research is that doses of nature are good for mental health and wellbeing. If this is so, more than one mechanism may be involved. Experiencing nature may be good for people, but being in greener neighbourhoods may prompt them to take more exercise which also gives benefit.

Studies such as this one do not tell us what the mechanism(s) is (are), nor do they prove a direct or indirect cause. Indeed, causation may flow in the opposite direction if people with better mental and physical health have more opportunities to live in greener neighbourhoods. But this particular study established no link between mental health and levels of income, physical activity, education and neighbourhood deprivation whilst establishing connections with bird numbers and levels of vegetation cover. Also worth noting is that the subjects experienced neighbourhood birds and plants largely through their gardens.

While there is still much to learn, the sheer number of studies that have linked exposure to nature with health and wellbeing benfits (both mental and physical) in urbanised societies indicates nature is somehow acting as a cause.

People do vary in their degree of attachment to nature and that depends to some extent on their life experiences. It seems that childhood experience of living things and natural landscapes can help to create and reinforce that attachment, which can then become lifelong. People who are attracted to nature are more likely to be concerned about environmental issues and problems, and that concern can lead to pro-environmental behaviour changes.

A recent University of Derby study, commissioned by the RSPB, found that 10-11 year olds in East Midlands primary schools who were more connected to nature had and more pro-environmental and pro-nature behaviours and higher English attainment (as assessed by teachers and SATs at Key Stage 2).[50] Their connection to nature was measured using a questionnaire for 8-12 years old drawn up the RSPB and the University of Essex.[51]

Nature-connected children may retain that connection in adulthood and worry about environmental destruction, but many of them will do rather little about it. Other priorities demand their time and attention, or barriers prevent them from acting environmentally. There is a gap between our environmental values and attitudes and pro-environmental actions.[52]

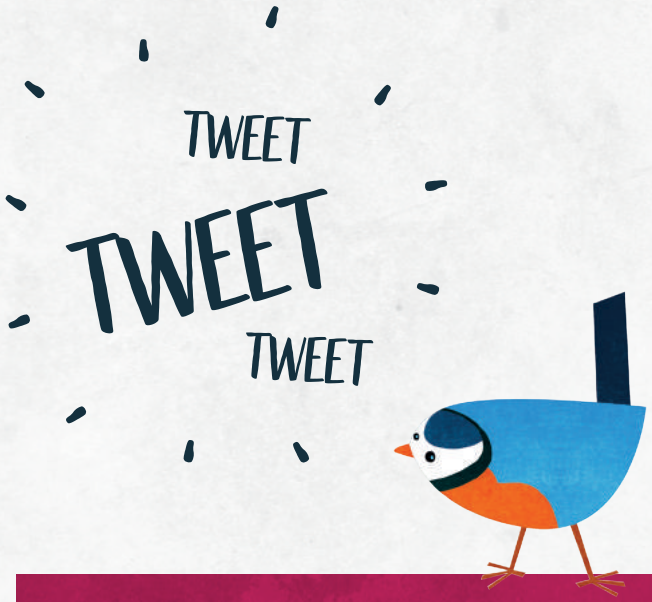
Furthermore, if people live in ways that are largely or entirely cut off from nature, especially during childhood, this may prevent an attraction to nature from developing in the first place. And that, in turn, may make our increasingly urbanised, indoor, and digitised societies less willing and capable of addressing mounting global environmental problems, chief among them dangerous climate change and the sixth great extinction event in earth history.

There are signs of a growing disconnect from nature among both children and adults. The media reports regularly on surveys which reveal startling levels of ignorance among today's children and their parents; for example not knowing that potatoes grow in the ground or that conkers fall from horse chestnut trees.[53]

Several studies have shown that today's children spend far less time playing outdoors, both in the nearby streets and in natural and semi-natural surroundings, than their parents and grandparents did.[54] Recent Government-commissioned research found that 12% of English children (1.3 million) had not visited the natural environment in the 12 months before they were surveyed.[55] Another survey published in 2016 found that 74% of 5-12 year olds played outdoors for less than 60 minutes a day on average, while UN guidelines for prisoners require "at least one hour of suitable exercise in the open air daily." Children spent twice as much time on screens inside as they did playing outside.[56] Other work in the United States has found "a fundamental and pervasive shift away from nature-based recreation" among adults.[57]

“...I’ve been raised like that, and that’s how I am going to raise my children to look after animals, to look after wildlife, enjoy the natural wonders around us.”

LOUISE
MOTHER OF TWO, READING



THE MAPPINESS APP

One of the most ingenious devices used to demonstrate nature’s benign effects on people is Mappiness, an app for iPhones. During daytime, at random intervals, it sends a message asking volunteers who have installed the app to rate how happy they feel at that moment using a touchscreen slider scale. It also asks who they are with, what they are doing and whether they are indoors, outdoors or in a car. If they respond to the questions, the app locates precisely where they are on a UK map from their ‘phone. Using weather data, it also records whether it was cloudy, raining, snowing, foggy or sunny in that location at the time.

From the location data it was also possible to record which of 26 different types of surroundings respondents were in – urban or suburban, woodland, coastal, farmland and so forth. The first Mappiness results to be published used data from over 20,000 participants who together provided more than a million responses.[58]

Researchers from the London School of Economics found that “on average study participants are significantly and substantially happier outdoors in all green or natural habitat types than they are in urban environments.” Being by the seashore made people happiest, followed by uplands and heathlands and then woodlands. Snow and sunshine were the weather conditions that made people happiest.

More than 2,000 happiness recordings came from people who said they were gardening at home or in their allotment at the time they were messaged. Gardening was found to significantly increase happiness, not as much as running or birdwatching, but more than fishing and hiking. The happiness boost it gave people was greater than that which came from being in any green surroundings apart from by the sea or on upland or heathland.

Do gardens specifically improve wellbeing?

How do gardens come into this? They feature rarely in this research into the benign effects of nature on people. Yet it could be argued that gardens and gardening offer more support for the beautiful and beguiling biophilia hypothesis than anything else. More than the tens of millions of people visiting UK national parks each year, the viewing figures for the BBC's Planet Earth II and the RSPB's huge membership base.

Gardens exist because people want their own small portion of nature right next to their homes. These reduce or remove the unpleasant features of urban living – noise pollution, the sense of being overcrowded and hemmed in. They bring us many of the things that attract us to nature, including wildlife, and in doing so they make us happier and healthier.

One reason for this is that gardens offer us plenty of opportunities for physical exercise, from children leaping on trampolines to adults lifting weeds and digging over soil. With obesity levels rising, causing serious harm to health, and the overall amount of exercise taken by the population falling, gardens are a critical health resource.

While children play less in outdoor surroundings away from their homes than they once did, they still play in their gardens. A survey for Natural England found that 75% of UK children aged 7-11 named their garden as one of the three places they played in most often (slightly less than the 83% naming "at home or in my friend's home, indoors").[59] For adults recalling where they played most often as children, these percentages were similar – 77% (and 76%) respectively. Research which has monitored children's exercise using GPS tracking and wearable accelerometers has shown that gardens are among the most important places, especially for urban children, for the vigorous physical exercise they all need.[60]

Gardens and gardening bring health and wellbeing benefits for adults, too. One study in the Netherlands found that pensioners with allotments were significantly healthier and had better well-being than their non-allotment using neighbours.[61] In another experiment, allotment gardeners were asked to carry out a stressful mental task, then allowed to relax for half an hour by reading indoors or working on their plots.[62] Levels of the stress response hormone cortisol in their saliva fell significantly further among the group allowed to garden. And a 16-year study into lifestyle factors and dementia covering nearly 3,000 Australians aged 60 plus found that 10% developed dementia, but for those who gardened every day the risk was reduced by 36%.[63]

It is not just that gardens and gardening give us space and motivation to exercise, important though that is. The trees and shrubs in our gardens, combined with all of the other urban vegetation, lower levels of air pollution slightly by taking pollutant gases and particulates into and onto their leaves.[64] Urban greenery inside and outside of gardens can also help to reduce noise pollution and dangerously high urban air temperatures during heat waves.[65] But even more importantly, the wellbeing benefits we gain, and probably some of the health benefits too, come from the ways in which gardens allow us to connect with nature.

We can plant and cultivate, watch the seasons pass, see plants going through their lifecycles of growth, flowering and setting seed and fruit and a variety of wild birds and animals coming in to feed and breed.

People tell researchers that this connection to nature is one of the pleasures of, and motivations for, gardening.[66] The UK's largest in-depth survey of wildlife-friendly gardening, which gained responses from more than 500 households in Leeds, found 41% said that watching or attracting wildlife was one of the most important uses of their garden.[67] And 58%, claimed they spent time watching wildlife in their garden on a daily or weekly basis.

The latest research commissioned by B&Q strongly supports this, with respondents placing high value on seeing wildlife in their gardens and on enabling their children to see it **(see Appendix)**.

What people do in their gardens tells us just as much about this desire to connect with the nature next to and around their homes. Feeding wild birds is its most common and direct expression. More than half of UK households say they provide food for birds and one review found 28% have a bird feeder outside their homes, equivalent to one feeder for every nine feeder-using birds in the UK.[68] Some households will only provide food sporadically (though the Leeds survey found 52% of households claimed to put out bird food once a week or more through winter) and some bird feeders will sometimes be empty. Even so, a visit to any garden centre reveals that provisioning wild birds is a gardening passion with sales estimated at £210 million a year.[69] People participate because it gives them a connection to nature which they enjoy; they feel they are providing real benefit to birds.[70]

There are other important ways in which people try to support wildlife in their gardens. The Leeds research asked households how many out of 13 different wildlife-friendly garden features they had, such as a bird box, pond, compost heap, log pile, berry-bearing plants and a wild or uncultivated area.[71] The average garden had five such features. The three most frequently recorded features (flowering plants, shrubbery, trees over two metres tall) were ubiquitous or very common across all gardens; even so, this survey and others – including the latest consumer research by B&Q - show that intentional wildlife-friendly gardening is now mainstream.

“...It’s lovely seeing nature on your doorstep, you don’t know what’s going to happen or when they are going to appear, it is a lovely feeling knowing you are doing something.”

LOUISE
MOTHER OF TWO, READING

“...We’ve got a bat, several bats, that fly around at night... it’s realising all the amazing stuff that’s in your back garden.”

GEMMA
MOTHER OF TWO, BRISTOL

“...It’s nice to stand in your house and see something living off the land or just bathing itself or doing whatever, knowing that they are doing that because they are comfortable and I’m not scaring it off.... not only that, my little boy gets educated... it’s another way of entertaining him and educating him at the same time.”

CRAIG
FATHER OF ONE, PORTSMOUTH

Wildlife-friendly gardening, environmental attitudes and actions

If nature in gardens is good for people, and if many or most are willing to support garden wildlife, does it follow that having a garden makes us more environmentally aware and concerned and more green in our behaviour?

Here, too, it is difficult to establish the flow of causality in trying to answer this kind of question. People who are inclined to be environmentally aware are likely to feel connected to nature, to incline to pro-environmental behaviours and will probably want to have a garden. The Leeds research found a link between how wildlife-friendly gardens were and pro-environmental activities such as recycling and growing food in an allotment, but no link with levels of concern about global environmental issues.[72]

The qualitative and quantitative consumer research commissioned by B&Q found widespread concern that UK wildlife is under threat. Almost two thirds of survey respondents said they enjoyed seeing wildlife in their gardens while almost half claimed that supporting wildlife in their own backyards made them feel good about helping the environment **(see Appendix)**.

People felt they could have little impact, on their own, on major environmental issues although they "did their bit" through actions such as recycling. But their gardens enabled them to make their own contribution to supporting nature.

Future research will shed more light on the links between gardens, gardening and environmentalism while struggling to establish causation. It is already clear that our gardens are prime locations for bringing people and nature together and for preventing them, from childhood onwards, from falling apart. They are spaces where children and adults can learn about the astonishing variety and ingenuity of wildlife. They can help to sustain and raise environmental awareness and consciousness. And is there a better way to appreciate the impacts of climate change, and to raise awareness of global warming, than to look after a garden and see what extremes of temperature, rainfall (drought or flood) and wind can do?

This is not to say that every gardener will become a campaigning environmentalist committed to saving the planet. But the power of gardens to bring nature to people can only help the cause. Some of the best evidence for that is all of the campaigning and the awareness raising on wildlife-friendly gardening carried out by UK environmental and nature conservation NGOs.

74%

of 5-12 year olds play outside for less than one hour a day.

WELLBEING

and health, mental and physical, is improved by our gardens.

CHILDREN

benefit from gardens as key places to play, make discoveries and get active.

“...I am passionate about recycling and the environment but I’m not going to change that on my own. But I can go out into my garden and appreciate wildlife on my own.”

CRAIG
FATHER OF ONE, PORTSMOUTH

WILDLIFE-FRIENDLY GARDENING – A UK WHO'S WHO

Several environmental and conservation organisations, including some of the UK's best known, campaign for wildlife-friendly gardening or encourage their members, supporters and the public to engage in it.

Amphibian and Reptile Conservation Trust
www.arc-trust.org/dragons-in-your-garden

Bat Conservation Trust
www.bats.org.uk/pages/encouraging_bats.html

British Dragonfly Society
www.british-dragonflies.org.uk/node/6933

British Hedgehog Preservation Society
www.britishhedgehogs.org.uk/leaflets/L16-Gardening-with-Hedgehogs.pdf

British Trust for Ornithology (BTO)
www.bto.org/volunteer-surveys/gbw/gardens-wildlife/gardening

Buglife
www.buglife.org.uk/activities-for-you/wildlife-gardening

Bumblebee Conservation Trust
http://bumblebeeconservation.org/get-involved/gardening-for-bees

Butterfly Conservation
http://butterfly-conservation.org/11908/gardening.html

Friends of the Earth
www.foe.co.uk/living/index_home_front

Froglife
www.froglife.org/info-advice/wildilfe-gardening

People's Trust for Endangered Species
http://ptes.org/get-involved

Plantlife
www.plantlife.org.uk/wildflower_garden

Royal Society for the Protection of Birds (RSPB)
www.rspb.org.uk/get-involved/community-and-advice/garden-advice

The Wildlife Trusts
www.wildlifetrusts.org/gardening
The Wildlife Trusts have also partnered with **The Royal Horticultural Society** on several wildlife gardening projects, including a joint website - www.wildaboutgardens.org.uk

The RHS, the UK's leading gardening organisation, also has extensive information and advice about wildlife gardening on its own website – www.rhs.org.uk

The **National Allotment Society** supports wildlife friendly gardening - www.nsalg.org.uk/allotment-info/wildlife-gardening-on-allotments

The UK's **Wildlife Gardening Forum** (www.wlfg.org) brings together several hundred organisations and individuals which together want to develop wildlife-friendly gardening by sharing information and experience to build a high quality evidence base.

In Scotland, the **Garden for Life Forum**, supported by the environmental improvement charity Keep Scotland Beautiful, is a partnership promoting wildlife-friendly gardening north of the border - www.keepscotlandbeautiful.org/community-projects/garden-for-life.

Planting for pollinators is a great way to encourage butterflies and bees to visit. It can be done in a pot or a border. The more you can plant the more visitors you are likely to attract.


Thyme


Our gardens' FUTURE ROLE in nature conservation

Gardens can work for and against wild plants and animals. There are three reasons why gardens could make a growing contribution to nature conservation in the UK.

First, biodiversity taken as a whole is declining in the wider countryside, and this may give gardens an increasingly important role by default. Second, our gardens have the potential to become better habitat. That can happen if people's love of nature and of their gardens is harnessed to make them better at wildlife-friendly gardening. And, third, when people engage with wildlife in their gardens it can deepen their appreciation of nature and their understanding of the threats to it – perhaps making them better all-round environmental guardians in the process.

UK nature on the run

The UK's latest *State of Nature 2016* report, published in 2016, pools data and expertise from more than 50 nature conservation and research organisations. It paints a complex picture but its overall message is one of biodiversity decline. The UK's official biodiversity indicator statistics, used by the Government, tell the same story.[74]

The *State of Nature 2016* looks at the abundance of nearly 4,000 terrestrial and freshwater species over a 43 year period from 1970. Of these, 40% showed strong or moderate declines, 31% showed little change and 20% showed strong or moderate increases. The same pattern is found in more recent years, from 2002 onwards, with substantially more species declining than increasing.

The *State of Nature 2016* also looked in more detail at year-to-year abundance (how many individuals) and occupancy (how widespread the species is) data for 2,501 terrestrial and freshwater species between 1970 and 2013. It found an average annual decline of 0.4%, summing up to a 16% drop over those 43 years.

The continued intensification of agriculture is the most important influence on wildlife, responsible for most of the overall decline, argues the *State of Nature 2016*. Ploughing up pastures and meadows, applying more chemicals and removing hedgerows have made land more productive for food and less use for nature. The next most important factor is climate change, although to date this has tended to increase the abundance of the plant and animal species being monitored. Some species have been able to extend their range northwards or are more likely to survive the milder winters.

BIODIVERSITY

taken as a whole, is declining in the wider countryside, and this may give gardens an increasingly important role.

67% AVERAGE

decline in population for 213 of the UK's most threatened species since 1970, according to the *State of Nature 2016* report.

16% DECLINE

in UK wildlife since 1970, based on monitoring 2,501 species.

HEDGEHOG

numbers in the countryside may have halved since 2000.

Gardens as nature reserves

Against this background, can our gardens provide a refuge for species? For many plants and animals, including some that are rare, declining or threatened, the answer is no. For one or other of the reasons given above, gardens cannot provide them with suitable habitat. The skylark and all of the other ground nesting birds are obvious examples; they are too vulnerable to predation by pets, urban foxes and rats and disturbance by people. Some butterfly species require large areas of suitable habitat such as peat bogs for the Large Heath or heathland for the Silver-studded Blue; they are not found in gardens.

Protecting such species requires us to conserve or re-establish areas of their natural and semi-natural habitats which have drastically declined, such as ancient woodlands, coastal marshes, 'unimproved' (i.e. unfertilised, undrained and unploughed) upland moors, lowland wildflower meadows and chalk downland.

Yet ordinary gardens are providing habitat for many thousands of 'common or garden' species of native wild plants and animals. Many of these are small to tiny and known to the public only as weeds, mini-beasts and bugs. They require an expert to identify them – even if that expert is an informed and enthusiastic amateur naturalist.

These uncelebrated species play their part in ecosystems, and help provide food for larger animals that are noticed and welcomed in gardens – birds and mammals (especially hedgehogs and bats). An impressive and sometimes surprising range of wildlife seems willing and able to make use of gardens and other urban green spaces including deer, badgers, foxes, and several raptor species (birds of prey).

Evidence is also mounting that urban areas can be a refuge for insect pollinators that play a critical role in fertilising many of the plants in our gardens, in the wild and in fields (see box below). Several studies have found that the abundance and species diversity of bees is higher in towns and cities than in the nearby countryside.[82]

THE MYSTERY OF THE DWINDLING HEDGEHOGS

The hedgehog has long held pole position as gardeners' most welcome wild mammal. It eats slugs and snails. It is small, harmless and too slow to flee in a flash when discovered. It charms children and grown ups by rolling up in a ball when threatened. So it easily topped a poll by BBC Wildlife Magazine to choose the best symbol for British wildlife.

All of that affection has not spared it from a significant population decline in the UK and several other western European nations in recent decades. The exact cause is not known and there are probably several factors involved including road kills, fragmentation and loss of its preferred semi-natural habitats (hedgerows and woodland edges) and the change to modern arable farmscapes reducing the invertebrate food supply (molluscs, earthworms, insects) that hedgehogs depend on. Badgers may also have played a role, although this is contested by some conservationists.[75] Badgers eat the same food as hedgehogs and they also eat hedgehogs; their numbers have been rising. Yet the two species have coexisted for thousands of years in the UK.

The depth and speed of the hedgehog's decline is also a bit of mystery, given that they are difficult to count. Two different surveys of rural hedgehog numbers indicate declines of more than 9% a year between 2000 and 2014, continuing a population slump that began in the last century.[76] However, two established experts recently analysed hedgehog sighting data old and new and concluded that hedgehogs were still widespread in England, with the area in which they are found shrinking by only 5 - 7.4% over the past 50 years.[77]

While hedgehogs are declining in the countryside, surveys show that their numbers within towns and cities are falling more slowly or holding level in the UK.[78] Several UK and European studies have also shown that hedgehogs live at much higher population densities in urban areas than in the countryside.[79] Possible reason are that their natural food supplies are supplemented by people leaving them petfood in their gardens, that they can escape badger predation in towns and cities and that milder urban winter temperatures and better, more abundant hibernation sites in gardens increase their survival through the coldest months compared to their country cousins.[80]

Yet the urban hedgehog faces one big hurdle – the garden fence. One hedgehog has to roam across many gardens in order to find food and a mate. It may be small and slow but it can travel one mile in a night and wander across over 50 hectares (half of a square kilometre) in a summer. It has been estimated that a population of a few dozen hedgehogs needs a minimum of nearly one square kilometre of habitat to remain viable.[81] Which is why one of the main aims of Hedgehog Street (www.hedgehogstreet.org), a campaign for the urban and suburban hedgehog, is to persuade people to create 13 cm-wide openings (Hedgehog Highways) at the bottom of their garden fences. The campaign is run by the British Hedgehog Preservation Society and the People's Trust for Endangered Species.

Gardens, birds and wildlife in trouble

BTO researchers have estimated the proportions of the total UK populations of 20 breeding bird species that are found in areas of human habitation – cities, towns and villages – at any one time.[83] These areas cover 11% of the UK surface area; within them gardens provide key habitat for urban and suburban-dwelling birds. Using data collected by hundreds of volunteers in the British Breeding Birds Survey, the researchers estimated that 24% of song thrushes, 33% of blackbirds, 20% of dunnocks, 31% of jackdaws, 54% of starlings, 62% of house sparrows and 38% of greenfinches were to found in these areas of human habitation. These species were generally found at much higher densities in built-up areas than in farmland.

Research has shown that thrushes find very little food in intensively managed arable fields. An experiment in which birds were tagged with tiny radio transmitters and then tracked showed that the birds preferred areas of bare soil in nearby gardens to farmland.[84] As for the house sparrow, several factors may be to blame for the rapid decline in this quintessentially urban bird, including nest site availability and a reduced supply of invertebrate food. Research by the BTO has shown that gardens were the most used type of habitat for sparrows in towns and cities, more so than other types of urban green space.[85]

The song thrush, starling and house sparrow remain on the latest UK Red List of 'birds of conservation concern' drawn up by leading conservation organisations.[86] They are all still common and numerous birds but are on the list because of huge declines in the number of breeding adults in recent decades. Starling numbers fell by 70% in 25 years. The dunnock is on the Amber List of less (but still) threatened birds, along with several other birds often seen in gardens and above towns and cities including the bullfinch and the swift.

The house sparrow, starling, song thrush and bullfinch are also on the UK's lists of 'Priority Species' of animals and plants – those that are recognised in the biodiversity strategies of the UK government and the devolved administrations to be the most threatened and in need of conservation action.[87] In fact, 45 of these priority species (29 animals and 16 plants) are found in gardens according to the Wildlife Gardening Forum, including the hedgehog, two bat species, the common toad, common lizard, grass snake and 12 species of moth.[88]

In the coming years gardens may emerge as important habitat for a wider range of species that are declining in the wider countryside. Climate change might also give gardens a further nature conservation role, providing refuges for species that are changing their range (the entire area they can live in) because of changes in temperature and rainfall.

PRIORITY SPECIES

are those which are most threatened and in need of conservation action. At least 45 of them are found in our gardens.

Pop up a bird café.

UK PRIORITY SPECIES FOUND IN GARDENS

Seven bird species – spotted flycatcher, house sparrow, dunnock, hedge sparrow, bullfinch, common starling, song thrush.

Three mammal species – the hedgehog, soprano pipistrelle bat, brown long-eared bat.

Five reptile and amphibian species – slow-worm, common toad, grass snake, great crested newt, common lizard.

14 insect species – 12 moth species, one butterfly species (the wall butterfly) and one beetle (the stag beetle).

16 plant species – including chamomile, cornflower, penny royal and pasque flower.

The Wildlife Gardening Forum says this should be regarded as a minimum number. There may be more of the 1,150 priority species using gardens, but they have yet to be found.

Connecting habitats

This leads on to the critical issue of habitat connectivity. Scientists recognise that one of the key features of habitats is their degree of connection and proximity; how easy it is for species to cross between them. To survive and flourish, plants and animals usually need to be able to move between different patches of habitat by walking, crawling, flying or spreading seeds. Any local population in one small patch is in danger of being eliminated by natural disasters such as extreme weather or heavy predation. Moving yourself, or spreading your progeny, to other patches of nearby habitat is a key to survival. And species which migrate long distances need patches of habitat to rest and feed in en route.

This applies to garden habitats, too. They work for nature conservation because mobile species can use them to move through the wider landscape, spreading through and across towns and cities and gaining access to patches of habitat they can use in the countryside. Gardens will work for different species in different ways, depending on their requirements and what particular resources they can find in or near them.[89] Decades of observation have shown that several bird species, including winter migrants, flock into gardens at certain times in winter when they cannot obtain food in the countryside.

Pollinating insects can range across areas large enough to cover both town and country in their flights in search of nectar. For less mobile invertebrates, what determines whether they arrive in any one garden generally depends on what type of habitat is around or near it as much as what resources are on offer in that garden.

This habitat connectivity and the mobility of species within towns and cities and between urban areas and the countryside, means that our gardens are not insulated from the loss of biodiversity happening in the wider countryside. There is evidence for this. Jennifer Owen observed that many of the insect species she was finding in her garden became rarer through her 30 years of observation.

The latest *State of Nature 2016* report presents a mixed picture for the wildlife found in towns and cities. It looked at changes in the abundance of 761 species across urban areas, including gardens, and found that 31% showed strong or moderate declines, 34% showed little change and 35% showed strong or moderate increases. Those percentage changes look more hopeful than those presented for the larger group of nearly 4,000 species across all of the UK.

But the more detailed year-to-year data on abundance and occupancy of species in urban areas is not encouraging. Here, the State of Nature report looked at detailed information on 565 species found in towns and cities and found an overall 11% decline over the 1970-2013 period. That, too, is slightly less of a reduction than was found for the whole of UK biodiversity. However, there was a 10% drop in the occupancy and abundance of urban species in the more recent 2002-13 period; a significant quickening in the rate of decline.

To sum up, gardens can and do work for nature conservation. They have the potential to offset some of the serious damage to wildlife that has been done in the wider countryside. But given that gardens are multi-purpose spaces which cannot be reserved entirely or even mainly for wildlife, the question is - how can they be made better for wildlife?

"...There's not a lot that comes. I think it's because it's so built up and because of the area. They're not attracted here."

JOSS
MOTHER OF TWO, PORTSMOUTH

“...Gardens can be enhanced as a habitat by planting a variety of flowering plants, biased towards native and near-native species.”

RHS
PLANTS FOR BUGS, RESEARCH REPORT

GARDENS, BUMBLEBEES AND OTHER POLLINATORS

Gardens may play an increasing role in conserving the UK’s bumblebees. There are 24 different species of these big, furry, mostly colony-living bees living in the British Isles but most of them are in decline due to the loss of flower-rich farmlands and the intensification of agriculture. Two species became extinct during the past century, and seven have been put on the UK Biodiversity Action Plan’s list of Priority Species most in need of conservation. This is a part of wider decline in pollinators – insects such as bees, hoverflies, butterflies and moths which carry pollen from flower to flower –taking place not just in Britain but globally.[90] It is of real concern, because pollinators play a critical role in the reproduction of wild plants and in the growth of important food crops.

Every gardener knows that flowers attract bumblebees. Surveys have shown that bumblebee nests, where the colonies raise their young, can be more densely distributed in gardens than in the open countryside.[91] And recent research in Sweden has shown that having gardens next to intensively managed farmland not only increased the abundance and species diversity of bees, including bumblebees, but also increased the seed setting of one flower species found in the countryside and gardens, Campanula persicifolia, the fairy bellflower.[92] These effects extended more than 100 metres from the gardens into the countryside.

The Royal Horticultural Society has a ‘Plants for Bugs’ research project examining how the ‘nativeness’ of garden plants (whether they are native species growing wild in the UK, near-native close relatives or more exotic plants from the southern hemisphere) impacts on the variety and abundance of invertebrates (insects, molluscs, arachnids and crustacea) living on and around them. The first paper from this four-year study at the RHS’s Wisley, Surrey gardens have been published, examining how attractive these different plants are to pollinators including bumblebees.[93] The scientists conclude: “Gardens can be enhanced as a habitat [for pollinators] by planting a variety of flowering plants, biased towards native and near-native species but with a selection of exotics to extend the flowering season and potentially provide resources for specialist groups.”

The RHS’s ‘Perfect for Pollinators’ scheme lists dozens of flowering plants including wildflowers.[94] This aims to provide a well-researched selection of readily available plants which, between them, can provide abundant nectar and pollen through all four seasons, bringing more pollinators to gardens, balconies and window boxes. A Perfect for Pollinators logo based on the bumblebee is used to label these plants at the point of sale. University of Sussex scientists recently found that flowering plants on sale at six garden centres which were recommended as pollinator-friendly – including ‘Perfect for Pollinator’ varieties – were attracting, on average, four times more insects than non-recommended plants.[95]

How can gardens become BETTER for wildlife

Almost all gardens are some use to wildlife, so long as they have some plants and soil in them. So almost all gardeners are doing some good.

Only by paving and decking over all of a garden is it rendered near-barren.

It is also worth acknowledging that while millions of people dream of, or plan on, improving their gardens and make them more attractive for wildlife *and* themselves, they often lack the time, money, information and knowledge to make it happen. This was a key finding from the B&Q consumer research.

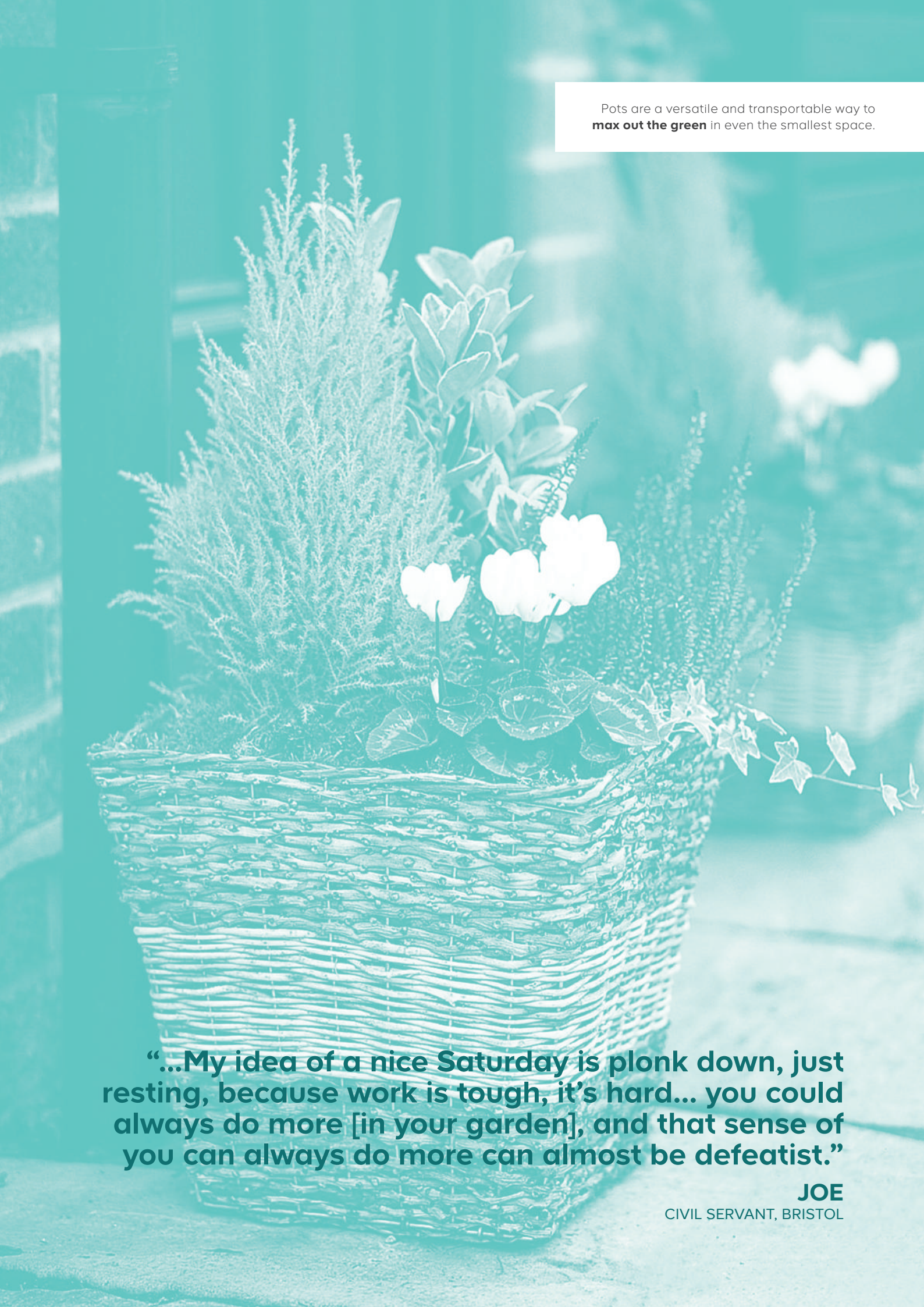
However, you do not even need a garden to make a contribution to wildlife – a balcony or even a window box will do. Pollinators will benefit from flowering plants on a balcony. Any kind of window box or tub with soil and plants creates its own compact eco-system. The birds which come to garden bird feeders will also make use of those hung on the balconies and roof terraces of flats.

There is no reason for households with small gardens to feel they cannot make a contribution. Unsurprisingly, larger gardens tend to have more wildlife-friendly features such as shrubbery, tree canopy and composting sites and a smaller proportion of their total area is covered in hard surfaces.[96,97] They also have a greater variety of plant species, both native and non-native.[98]

Basic laws of ecology say that the larger an area of habitat is, the more vegetation it will grow to put into food chains and the greater the number of species that will be found in it.

But even if these laws applied strictly to gardens, then small plots would still be welcome on the grounds that they are making some contribution to wildlife – and something is better than nothing. However, these laws apply poorly to gardens, because for many (and probably most) wild plant and animal species neighbouring gardens join together to provide one large patch of habitat. Or, more accurately, they join to form a variety of habitat patches – a scattering of mature trees, dense shrubbery, ponds and lawns. Half or more of all gardens are on the small side, but they make up such a large part of the overall garden resource that they cannot be ignored if the aim is to make any significant improvement in the overall wildlife-friendliness of UK gardens.[99]

So how can gardens of all sizes be managed to favour wildlife? There is widespread expert agreement on the basics of how to do this. There is an equally widespread recognition that our gardens are multi-functional places which have to be just as people-friendly as they are wildlife-friendly. No one wants us to get less enjoyment from them, or to make them any less beautiful or useful for humans.



Pots are a versatile and transportable way to **max out the green** in even the smallest space.

"...My idea of a nice Saturday is plonk down, just resting, because work is tough, it's hard... you could always do more [in your garden], and that sense of you can always do more can almost be defeatist."

JOE
CIVIL SERVANT, BRISTOL

Just add water – a pond or a bird bath is attractive to birds, insects and other wildlife.

The Wildlife Gardening Forum has produced a short manifesto for gardens, people and nature which advocates "ten simple ways to help wildlife in gardens." These ten propositions distil everything that is known about wildlife-friendly gardening.

1. Grow a variety of trees, shrubs and climbers, and plant a hedge, to give food and shelter.
2. Look after mature trees in and around your garden – they are the best feature for many species of wildlife.
3. Add water – an upturned bin-lid is a start, or better still, a pond.
4. Brighten your garden throughout the year with pollen- and nectar-rich flowers for bees, butterflies and other insects.
5. Create a pile of dead wood, preferably half buried, making a home for everything from beetles to hedgehogs.
6. Build a compost heap, which helps wildlife and your gardening.
7. Provide food and water for birds year round. Keep the feeders clean, so they don't spread diseases.
8. Relax! Leave some areas undisturbed and take time to enjoy the wildlife they attract.
9. Allow a patch of lawn grass to grow longer, helping flowering plants to bloom, and creating habitat for insects and small mammals.
10. Minimise your use of water, peat, chemicals and other resources to reduce your impact on the wider environment.

One quite impractical proposition could be added to these ten: Have your garden in the right place, close to large patches of good habitat. A variety of research has shown that gardens in or near the countryside, or in suburban areas with plenty of other gardens and green urban areas nearby, tend to harbour more wildlife than those in the most built-up inner urban areas. This finding covers reptiles and amphibians[100], birds[111], mammals[102], pond invertebrates[103] and bee and hoverfly pollinators[104].

But people can't easily change the amount of green habitat near their gardens (although they can become 'guerrilla gardeners', or find other ways of working communally and with local councils to green grey areas). They can, however, make their gardens more attractive to any wildlife that does arrive, as set out in the ten propositions, and make their garden perimeter more permeable to wildlife. Hedges instead of fences **(see Proposition 1)** – or fences with some small gaps at the base – make it easier for hedgehogs and amphibians to arrive.

Three sound, practical and widely accepted rules of wildlife-friendly gardening that can be added are:

a) Do not cut back all of the plants that are dying or dead in the autumn – leave that until the spring. If they are left standing over winter they provide food and shelter for wildlife, as well as some extra colour and structure in the garden.

b) Devote as much of your garden as possible to plants and soil, minimise the area covered by hard surfaces.

c) If you have a cat, keep it indoors at certain times or make it wear a bird-scaring device that is known to be effective when it goes out.

Minimising cat predation

There is no easy solution to the problem of feline predation apart from not owning cats. The B&Q research found widespread awareness of this issue **(see Appendix)**. Wearing a bell on a collar may scare off some prey, according to some studies.[105,106,107] Various other bird-warning devices for cats to wear have come on the market in recent years. For one of these, a large and colourful collar, there are peer-reviewed scientific reports of trials which suggest the device can achieve a large reduction in predation of birds and reptiles (though less so for small mammals, which have poorer colour vision).[108] The RSPB markets an ultrasonic cat deterrent which emits a noise whenever a cat walks past; an evaluation "indicated…a moderate deterrent effect.[109]

The RSPB's website has pages of advice on helping people to deter cats from entering their gardens and on managing their gardens, bird feeders and bird boxes to give birds a better chance of escaping.[110] It asks cat owners to keep their pet indoors when birds are most vulnerable: at least an hour before sunset and an hour after sunrise, especially during March-July and December-January, and also after bad weather, such as rain or a cold spell, to allow birds to come out and feed. The Bat Conservation Trust's website also offers advice about what times of day and night to keep cats indoors to reduce bat kills.[111]

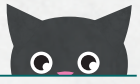
For a nation of cat lovers, this is a sensitive issue. But given the hard evidence about levels of cat predation on garden wildlife, efforts to promote wildlife-friendly gardening should take it into account.

Liberating the lawn

Some gardeners will find some of the 13 propositions set out above hard to respond to. In a small garden it is often difficult to find room for a hedge or an undisturbed area, or to accommodate a large tree. Parents with small children will not want to have a garden pond, for obvious safety reasons. But these are ten (plus three) propositions, not ten commandments, and if a gardener can only follow a few of them, she or he will still be joining with all the others in the neighbourhood to offer some support for wildlife.

Proposition Number 9, on lawn mowing, faces particular resistance from millions of gardeners. A wildlflower meadow in its full summer profusion is a glorious sight as well as being abundant with plants and animals. A four year RSPB/ Imperial College research project in which 25 plots of mown grass in 19 London parks were allowed to grow long, or replanted with mixtures of wildflowers and grasses, found large increases in the number of invertebrates which in turn benefited the birds that prey on them.[112] But a lawn with long grass and weeds is generally seen as neglected, whatever its wildlife-friendly credentials. Long grass which people have walked and lain on (and let's not forget that garden lawns are meant to be walked and lain on) looks trampled and even less attractive. In the UK, a research project examining seven different types of wildlife-friendly interventions in 34 Sheffield gardens had planned to include letting patches of lawn grow long.[113] But this experiment soon had to be abandoned because "garden owners were typically found to be extremely reluctant to allow even relatively small areas of lawn to go uncut…often from a concern as to how their neighbours would react."

Here, too, it should be accepted that people with small gardens may not be able to spare any of their lawns from regular mowing. But for those with average and larger than average gardens and lawns, a cultural change is needed. Part or parts of the lawn should be allowed to grow long and become full of flowering daisies, buttercups and other forbs with just one or two mowings each year. Wildflowers can be brought in through plugs or seeds. Paths can be mown across these garden mini-meadows and along the edge of flowerbeds, to allow people to cross them and maintain the rest of the garden without trampling the long grass. Alternatively, a broad strip of grass next to a garden boundary can be left to grow. The gardening media and the horticulture and gardening industry should spread this message of benign, controlled and partial lawn neglect helping wildlife, offering advice and inspiration on how to do it well.



CATS

can be harmful to birds - people recognise this. But there are ways to reduce the risk.

Making wildlife friendly gardening the norm

Our gardens and outside spaces could offer real hope for our beleaguered wildlife. Everybody has a part to play and getting involved can be just as rewarding for us as it is to wildlife.

In the summary at the start of this report, B&Q sets out a user-friendly short list of pro-wildlife actions people can take in their gardens. Its starting point is that while many people want to do more to support wildlife, they usually lack information, advice and confidence about what to do and they may also lack time, money and space. The B&Q list has a strong focus on "getting started", prioritising actions which are quick, easy and affordable, which engage people with wildlife and have a good chance of attracting and benefiting wild species. The list also aims to appeal to people who only have a balcony, a roof terrace or a tiny garden as much as it does to those with larger outdoor space. It is based on, B&Q's own consumer research, this review of the evidence and the Wildlife Gardening Forum's manifesto.

The B&Q research found that people are open to more information and advice about wildlife-friendly gardening and "what works" while having limited time to take it on board **(see Appendix)**. Many recognise that their interventions may not always prove successful, but that need not make them give up.

"...There is a lot of trial and error with sort of thing and you are not guaranteed success, and I haven't had success in this in the last 18 months, I've had failure after failure."

JOE
CIVIL SERVANT, BRISTOL

A key issue in making progress is the extent to which gardeners influence each other. People are strongly influenced by what they see their friends, peers, relatives and neighbours doing; gardening is no exception.[114] If more people take up wildlife-friendly gardening, and it is seen to be beneficial, still more can be expected to follow. Research by Leeds University scientists found that concerns about disapproving neighbours prevent some wildlife-friendly gardening measures being adopted, such as leaving parts of gardens unmanaged or letting grass grow long.[115] However, the B&Q research suggested this was a minor barrier, with only 5% citing concerns about neighbours as a block on doing more to support nature in their gardens **(see Appendix)**. Some wildlife-friendly measures – such as hanging bird feeders and bird boxes or creating a pond – can spread as neighbours do likewise.

This mindset against unmanaged areas of garden and patches of unmown grass may change as awareness of wildlife-friendly gardening spreads. Local councils can also play a role, by managing suitable parts of green public areas in low-intervention, low-cost ways which favour native plants and animal species and by explaining the benefits to local people.

The Leeds researchers propose that neighbours could coordinate to make groups of gardens more wildlife-friendly, with advice and encouragement from councils. In Bristol, the Avon Wildlife Trust is trying to boost wildlife-friendly gardening throughout one of the UK's fastest growing urban areas through its My Wild City campaign **(see box on page 49)**.

Whether any one gardener who tries to make her garden more wildlife-friendly notices any difference in what comes into her plot will depend on her luck, her surroundings and her patience and powers of observation.

Why? Because gardens join up to provide larger areas of habitat. The birds, insects, amphibians and wild plants which come into any plot come from the neighbouring gardens, other urban green spaces and the nearby countryside. Having abundant, high quality habitat nearby is key to bringing more wildlife into any one garden, which is why as many gardeners as possible should join the cause and support each other.

Enthusiasm can be infectious. Which is why gardeners who are trying to bring wildlife to their gardens should share their passion and celebrate their successes with friends, family, neighbours and on social media, and also by taking part in surveys like the Big Garden Birdwatch. "Look out for wildlife in your garden and share your discoveries" is top of our starter list of ten wildlife-friendly actions.

While many of the wild plants and animals moving in will be small and inconspicuous, they all play their part. And for many gardeners there will be rich rewards. Sightings of newts courting underwater, sparrowhawks hunting, bats flitting by at dusk. Sounds of frogs croaking, blackbirds singing and bees buzzing. Our gardens are good for wildlife and that wildlife is good for us. They can be even better.

Give wildlife some shelter.

“...I had the right intentions, hoping my bird boxes would attract some little birdies, but I don’t know if they are actually fit for purpose.”

JOSS
MOTHER OF TWO, PORTSMOUTH

MY WILD CITY

The My Wild City campaign is asking Bristol’s citizens, businesses and community groups to transform gardens and green spaces into a city-wide nature reserve and a network of green corridors for wildlife. The campaign was launched as part of the Bristol European Green Capital 2015 initiative.

The campaign has a variety of projects and ambitions but one important aim is to get more households engaged in wildlife-friendly gardening with free advice in the form of online videos and leaflets. It has also created 20 detailed local maps covering the Greater Bristol area, intended to show the best opportunities for enhancing nature at the most local level.

Its message: “We are asking people to identify the areas in their neighbourhood where they can take action for wildlife, working with neighbours and the wider community.” These maps identify gardens with opportunities for tree, shrub and wildlflower planting.

The campaign has also created an online interactive map which enables individuals and groups to show what wildlife-friendly gardening activities they have undertaken, and where.

www.avonwildlifetrust.org.uk/mywildcity

“...It’s a lovely feeling helping. If we didn’t do it and everyone else had that same attitude, then they wouldn’t be there anymore. And that would be really sad.”

LOUISE
MOTHER OF TWO, READING

Appendix - Insights from B&Q-commissioned research

Key messages

- People accept that UK wildlife is in decline and are concerned about it.
- They appreciate that their gardens can help to support wildlife.
- They place a high value on seeing wildlife in their gardens, for themselves and their children. As well as enjoying the experience of seeing wildlife, and learning more about it, they feel good about making a contribution to nature and the environment through their gardens.
- They are mostly already doing something to support wildlife in their gardens, and aspire to do more – or are open to the idea.
- The main barriers are lack of time, money, knowledge and space.

B&Q commissioned quantitative consumer research to better understand people's values and attitudes concerning wildlife in their gardens. This took the form of an on-line survey of more than 2,000 adults drawn from YouGov UK plc's panel of 800,000 plus individuals. In the on-line survey, at least 81% of respondents claimed to have a garden, (close to the national percentage) while 3% said they only had a balcony. Londoners were far more likely to lack a garden (31%) than the overall sample (14%).

B&Q then commissioned qualitative research to explore the findings from the quantitative research further. Marketing Sciences Unlimited conducted in-depth interviews with householders in Reading, Portsmouth and Bristol in their gardens, forming six detailed case studies. The households had small gardens and represented both owner occupiers and tenants.

Of those respondents having a garden, 38% said they had a small amount of outdoor space less than half the size of tennis court (125 square metres) while 73% had access to garden space smaller than a tennis court (250 square metres). This, too, aligns well with national data – the average UK garden is 190 square metres.

Among the sample there was widespread acceptance that wild animals and plants were under threat in the UK. Almost two thirds (64%) of the sample said they were concerned that UK wildlife was under threat while just over a fifth (22%) had little or no concern, or rejected the premise that wildlife was under threat. Women were slightly more likely to be concerned than men (69% versus 58%). Younger people aged 18-34 were more likely to be 'not at all concerned' about threatened UK wildlife than those aged 35 plus (7% versus 3%). **(See figure 1)**

Next, the online survey asked people to give a reason why they thought "priority" wildlife species (i.e. species of conservation concern) had declined significantly since 1970. They were given a menu of 11 options to choose from (including 'Other' and 'Don't know') and on average they chose four of these. **(See figure 2)**

The expert, informed consensus is that there has been a significant overall decline in UK wildlife in the post-war period with multiple causes, but agricultural intensification and industrialisation is the predominant factor. Huge areas of natural and semi-natural rural habitats have been ploughed up, drained, treated with fertiliser and other agrichemicals and had their soil compacted by heavy farm machinery. Meanwhile the traditional management of woodlands has been abandoned and many hedgerows have been removed or poorly looked after. The survey answers showed awareness of these issues among non-experts, with 47% blaming 'Changes in farming (e.g. more intensive farming/agricultural practices)' and 53% blaming 'Pesticides and other chemicals being used by gardeners and farmers'.

However, the most popular reason selected was 'Less space for wildlife to live in the countryside (e.g. due to towns getting bigger)'. Three fifths of respondents (60%) chose that. They were right, in that changes in farming have left far less useful habitat in the countryside, but wrong if they believed that urban expansion was the main cause. While the area covered by UK towns and cities has grown rapidly through the past century, they still cover only a small proportion of the UK's total land surface.

Just over one third (35%) picked 'Climate change/extreme weather' as a reason for the decline in priority species. Young people aged 18-24 were more likely to choose climate change as a reason (50%) than those aged 24 plus (33%). However, when compared to the overall sample older people aged 55 plus were significantly more likely to select the spread of non-native invasive species (60% vs 46%), the use of agrichemicals (65% vs 53%) and the intensification of farming (59% vs 47%) as reasons for priority species decline.

74%

5-12 year old UK children play outside for less than an hour a day on average.

MORE THAN 1000

different species of plants and animals can be found in an ordinary garden.

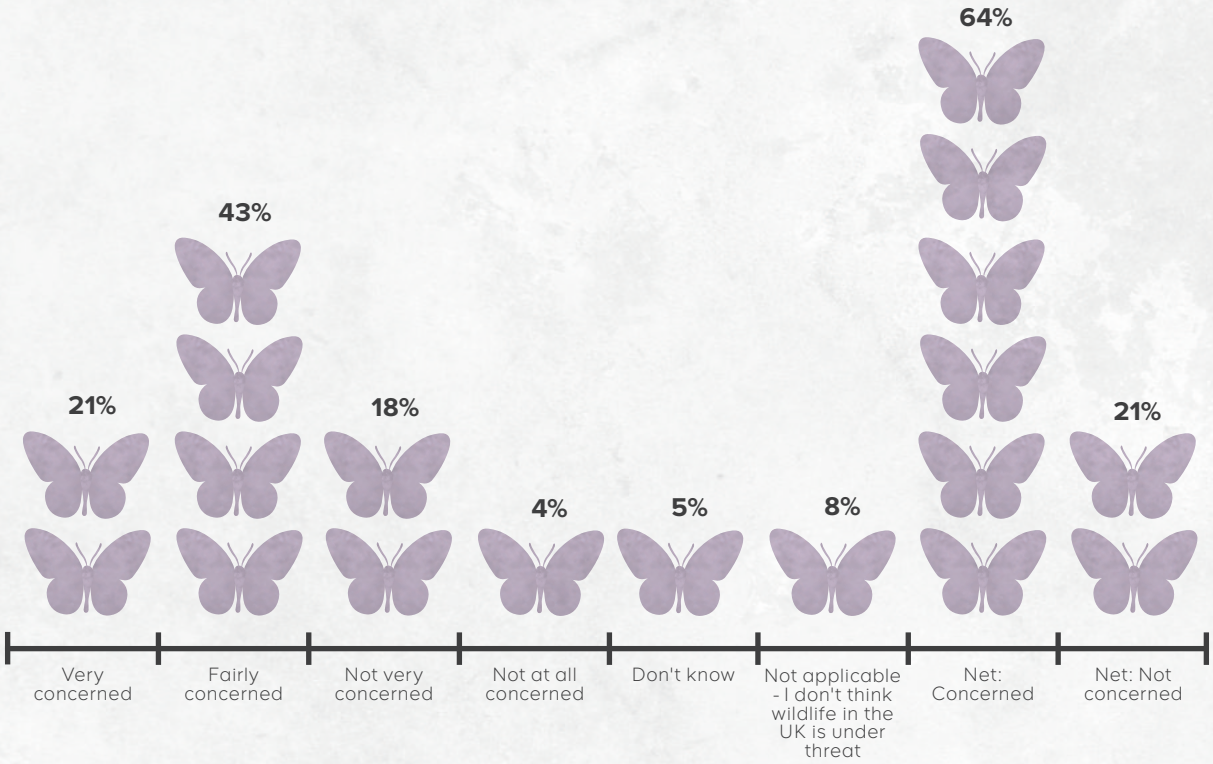


Figure 1: Level of concern about threat to UK wildlife

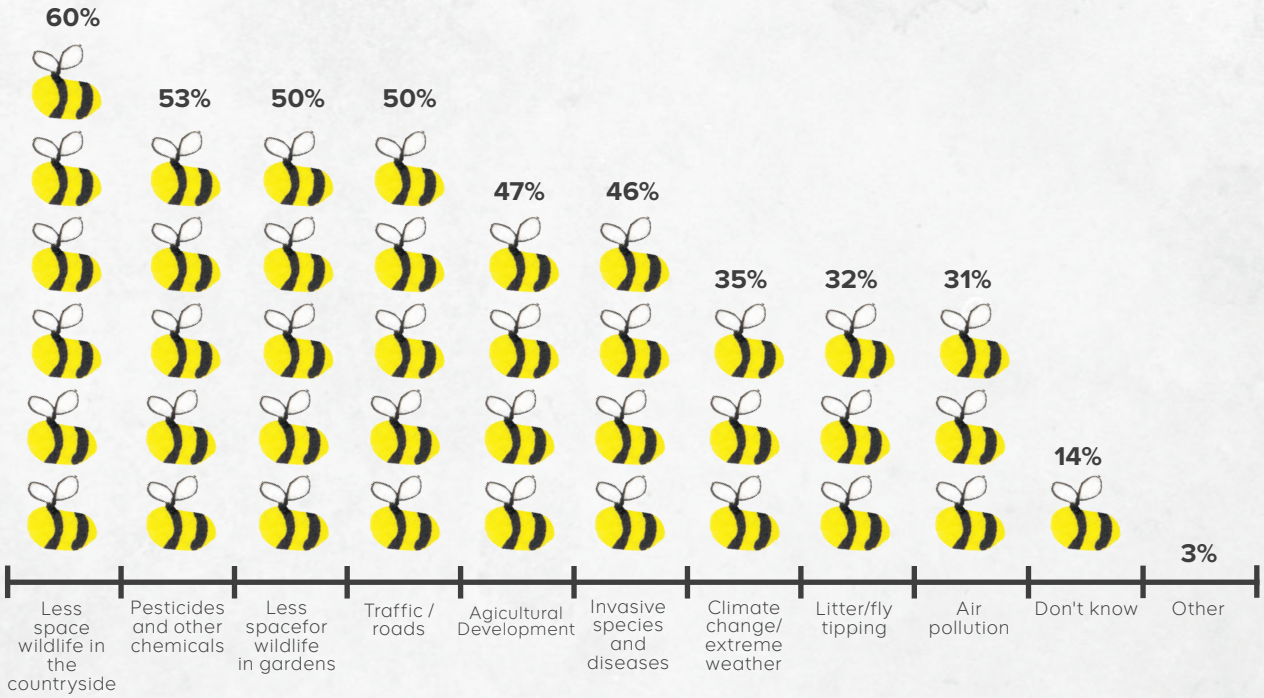


Figure 2: Reasons why householders thought "priority" wildlife species had declined significantly since 1970

The expert, informed consensus is that there has been a significant overall decline in UK wildlife in the post-war period with multiple causes, but agricultural intensification and industrialisation is the predominant factor. Huge areas of natural and semi-natural rural habitats have been ploughed up, drained, treated with fertiliser and other agrichemicals and had their soil compacted by heavy farm machinery. Meanwhile the traditional management of woodlands has been abandoned and many hedgerows have been removed or poorly looked after. The survey answers showed awareness of these issues among non-experts, with 47% blaming 'Changes in farming (e.g. more intensive farming/agricultural practices)' and 53% blaming 'Pesticides and other chemicals being used by gardeners and farmers'.

However, the most popular reason selected was 'Less space for wildlife to live in the countryside (e.g. due to towns getting bigger)'. Three fifths of respondents (60%) chose that. They were right, in that changes in farming have left far less useful habitat in the countryside, but wrong if they believed that urban expansion was the main cause. While the area covered by UK towns and cities has grown rapidly through the past century, they still cover only a small proportion of the UK's total land surface.

Just over one third (35%) picked 'Climate change/extreme weather' as a reason for the decline in priority species. Young people aged 18-24 were more likely to choose climate change as a reason (50%) than those aged 24 plus (33%). However, when compared to the overall sample older people aged 55 plus were significantly more likely to select the spread of non-native invasive species (60% vs 46%), the use of agrichemicals (65% vs 53%) and the intensification of farming (59% vs 47%) as reasons for priority species decline.

The survey asked respondents with gardens or balconies to consider the benefits of bringing more wildlife into their outdoor space, giving them eight options to choose from plus 'Other', 'Don't know' and 'Not applicable – no benefit from bringing in more wildlife.' The great majority thought there were benefits with most selecting at least two from the list and only 12% finding no benefit at all. "I would enjoy seeing more wildlife in my own garden" (chosen by 63%) and "I would feel good about doing my bit to help the environment" (47%) were the most popular choices. **(See figure 3)**

Next, the survey asked people about how wildlife-friendly their garden or outdoor space was, giving them a list of eight features (e.g. 'Have a pond') or behaviours (e.g. 'Feed the birds') to choose from. On average, respondents selected three features/behaviours. Having plants that support pollinating insects (52%), feeding birds (51%) and having a tree or trees (49%) were the most frequently mentioned while having a pond (13%) was chosen least often. The great majority of people claimed to have or to do something wildlife-friendly in their gardens, with only 15% answering that they had or did nothing to support wildlife. **(See figure 4)**

70%

of UK's 60 butterfly species have become less widespread.

57%

of butterfly species have seen their numbers shrink.

THE AVERAGE

household garden (front and back) is 190 square metres in area – about three quarters the size of a tennis court.

29 MILLION

trees in our gardens – nearly a quarter of all the trees found outside woodlands and forests in the UK.

OUR GARDENS

occupy about a quarter of the land that lies with towns and cities, where 83% of the UK population live.

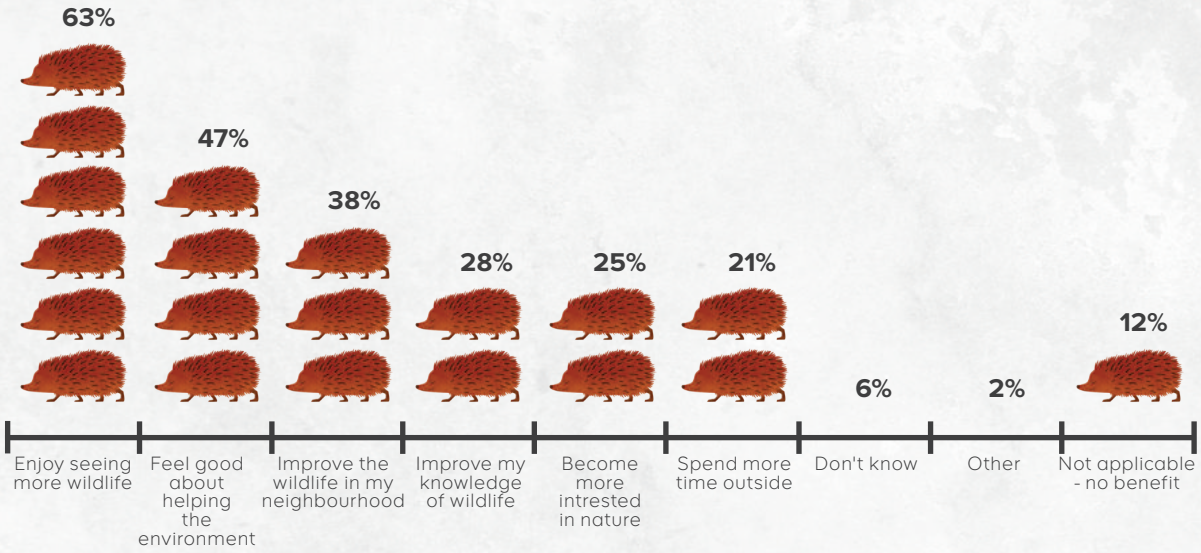


Figure 3: Main benefits to householders of bringing more wildlife into their gardens

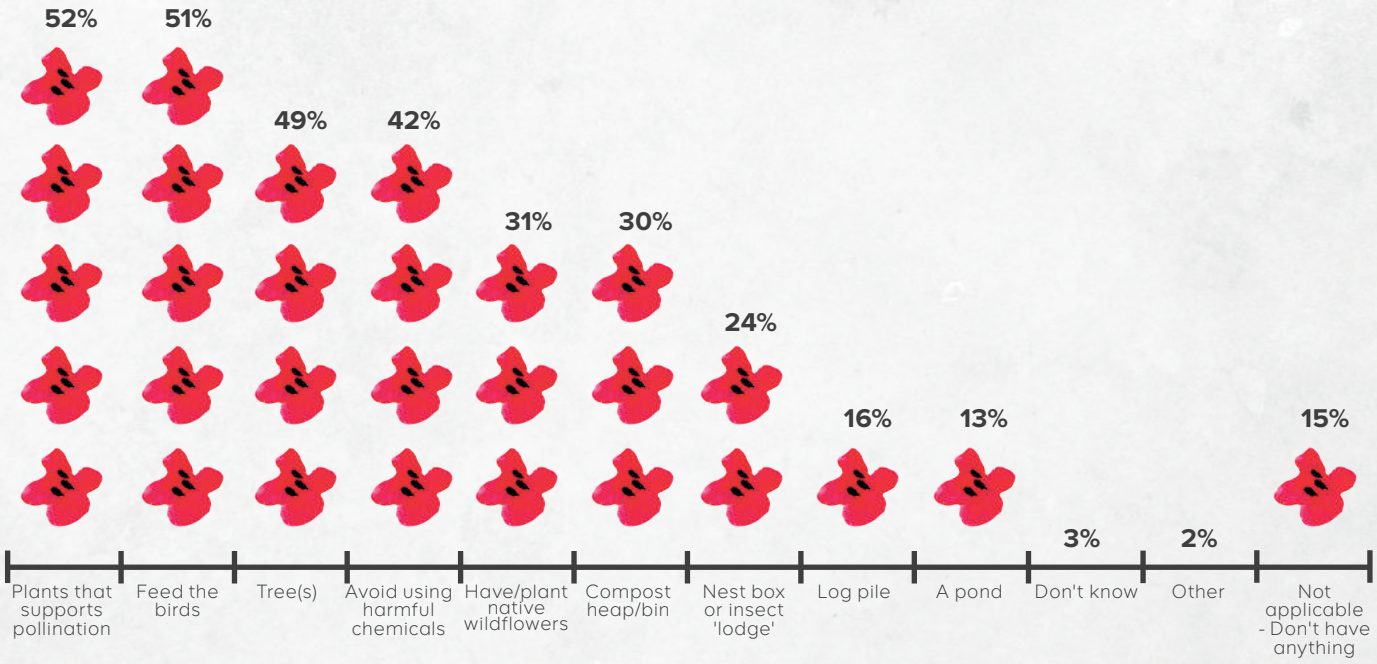


Figure 4: Wildlife friendly features identified in gardens

Age had an impact on responses with older people (55 plus) having higher than average responses on every feature. The 25-34 age group selected fewer garden features or behaviours than the overall sample. Not surprisingly, those with small gardens (less than 125 square metres) also had lower responses than the average for every feature/ behaviour with 21% of them claiming they had or did nothing to support wildlife in their compact outdoor space.

Respondents were keen to see greater biodiversity in their gardens with only 9% answering that they would not want to see any more types of wildlife. Given a menu of nine types of wild animal and plant to choose from, most of them chose at least three. Garden birds (71%), hedgehogs (59%), pollinating insects such as bees and butterflies (59%) and "insects that keep pests at bay (e.g. ladybirds, lacewings, spiders)" (46%) were the most popular choices. Older (aged 55 plus) and retired respondents were more likely to want to see all of types of wild animal and wild flowers in their garden apart from "larger mammals (e.g. badgers, deer)." **(See figure 5**

The final question in the on-line survey asked people about what prevented them from doing more to support nature in their gardens or outdoor space, including balconies. It gave them a menu of 11 options from which they could choose any number. A lack of time (24%), money (23%), knowledge (23%) and space (22%) were the most frequently chosen barriers, followed by a concern that they might attract unwelcome wildlife such as rats, pigeons and seagulls (21%). **(See figure 6)**

A substantial proportion, 22%, answered that there were was nothing stopping them from taking action to support nature in their gardens, while 15% selected "I do not enjoy gardening" as the barrier.

Here, too, older people emerged as more inclined towards wildlife-friendly gardening than the overall population. The 55 plus age group were less likely to choose any of these barriers apart from the concern about attracting unwelcome wildlife. It was the youngest age group (18-25) which emerged as more likely to select all of the barriers than the averages across the sample. Not surprisingly, those respondents with the smallest gardens were most likely to select a lack of space (34%) as the leading barrier to doing more to support wildlife.

The findings from this YouGov survey were strongly supported by the case study interviews. These were intended to explore motivations for wildlife and environmental support among potential B&Q customers with smaller gardens, focussing on their use of gardens in providing that support. This research also asked people about the barriers which prevent them from doing more.

The researchers concluded that the key learnings on attitudes to wildlife from these six case studies were:

- Everyone loves hosting wildlife in their gardens. There is something enjoyable and entertaining in supporting the local wildlife, and for those who are parents it can be educational for their children.
- Everyone would like to do more as the benefits are clear, not only for the planet but for individuals too. However, the extent of the problem wasn't always known and there were some surprises when the declines of species were mentioned.
- The barriers to doing more can be summarised as: a lack of time and/or energy, concerns due to pets (particularly cats) and a distinct lack of knowledge about the best way to support local wildlife.
- To do more, people need to know what to do and what difference this will make – information and encouragement are key.

The key learnings on attitudes to the environment were:

- Environmental problems are on too large a scale for individuals to do much about them. In most cases, tackling them is seen as a responsibility for government.
- The benefits of supporting the environment are less clear than the benefits of supporting local wildlife. People do not see the difference they make through things such as recycling or switching off lights.
- Everyone feels that they try to do their bit. Recycling seems to be the biggest contribution.
- The barriers to doing more tend to be a lack of knowledge and a lack of belief that people can make a difference.

For B&Q as a leading retailer and garden centre, the key learnings were:

- When it comes to supporting local wildlife and the environment, B&Q is not top of mind.
- Awareness and understanding of wildlife and eco-products is low. The range of products, particularly bird feeders, leaves people unsure about what the differences are or where to start. Peat-free is an unknown term, and people would need more information in order to consider it.
- Aesthetics play an important role when browsing the range and any supportive/ecological features have to fit in with the look and feel of the garden.
- Visual clues, such as images of birds on feeders, help understanding. The 'bee symbol' (the RHS 'Perfect for Pollinators' device) is understood and appreciated but not often spotted.

Three of the six interviewees spoke passionately about how their children engaged with wildlife in their garden and how good that made them feel as parents.

There was ruefulness, and even some guilt, about the gap between what the interviewees wanted or planned to do in their garden and what they had achieved. One of them, however, recognised that a degree of "leaving it – letting it rewild" can be good for garden wildlife.

The case studies showed a strong attraction to and appreciation of nature, especially birds but also mammals, pollinating insects and amphibians. There was recognition that wildlife friendly interventions, particularly installing a bird box, could fail to achieve the intended results and that cats posed a particular threat to birdlife. The interviewees readily admitted that they knew little about how to encourage wildlife and were open to finding out more.

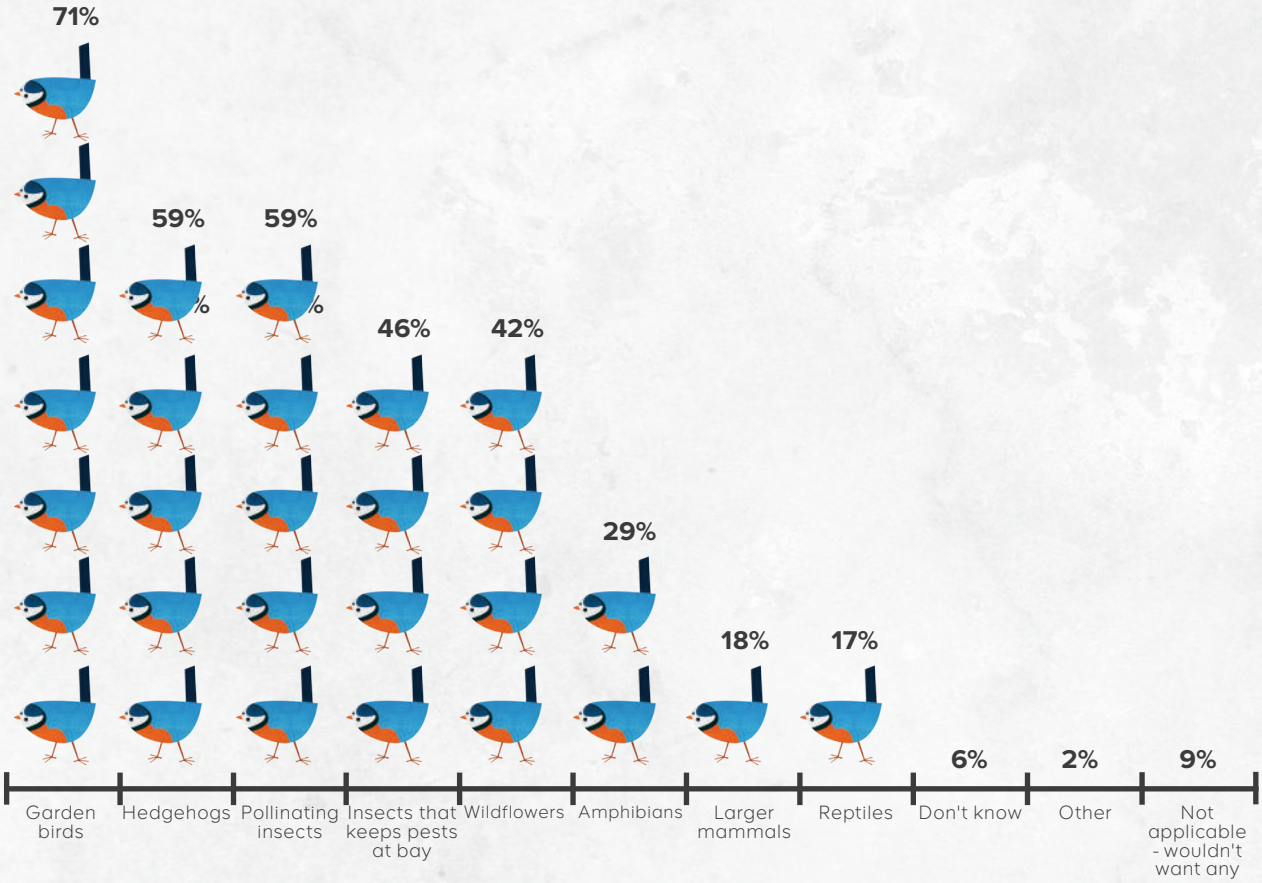


Figure 5: Types of wildlife that householders would like to see more of in their gardens

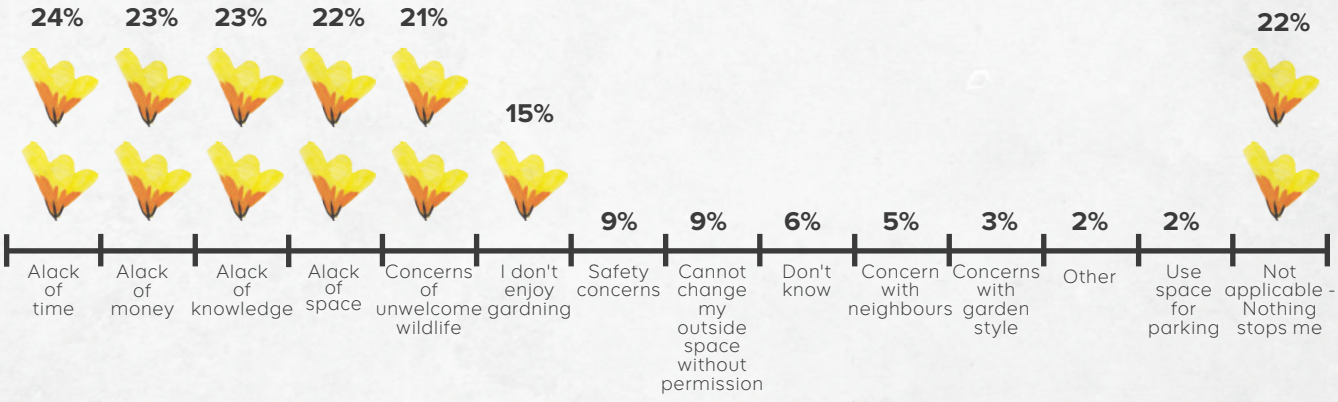


Figure 6: Main barriers to doing more for wildlife in gardens

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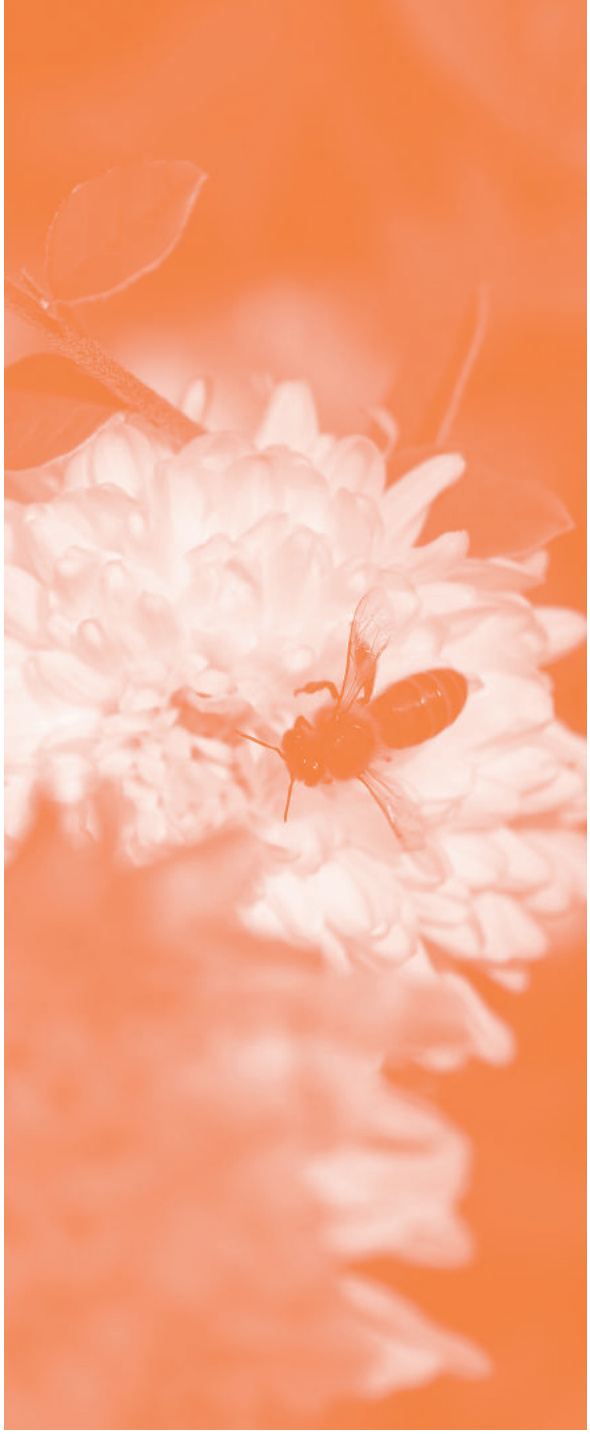

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Author

Nicholas Schoon, Policy and Communications Manager, bioregional.com

Editorial oversight

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