

Managing urban areas for insect pollinators

As town and cities continue to grow how can land managers help insect pollinators in urban areas?



Photo by Nadine Mitschunas

**Living With Environmental Change
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The Living With Environmental Change Partnership brings together 22 public sector organisations that fund, carry out and use environmental research and observations. They include the UK research councils, government departments with environmental responsibilities, devolved administrations and government agencies. The private sector is represented by a Business Advisory Board.

Insect pollinators are essential for food production and wild flower reproduction yet these important insects are declining in the UK and in other regions of the world. Multiple pressures including land use change, disease, climate change and agrochemicals affect pollinator populations and the services they provide. This has resulted in declining species richness in wild pollinator populations and local declines in abundance. Urban areas make up 9% of the land area in the UK and are growing. With the majority of the UK population living in urban areas there is huge pressure in these landscapes for plants and animals, including pollinators, to coexist. Therefore it is important that we manage our towns and cities favourably for insect pollinators.

Why are insect pollinators important in urban areas?

It is important to consider the needs of pollinators in urban as well as rural areas because:

- Interest in urban food growing and local food production is increasing in the UK, with more fruit and vegetables being grown in gardens, allotments and smallholdings. Many of these will benefit from pollination by insects.
- Pollination by insects such as bees and hoverflies is important for over three-quarters of wild flowering plant species in temperate regions to develop their fruits and seeds fully. Wild flowers occur in urban areas as well as rural landscapes so insect pollination is important for the long-term survival of wild plant populations.
- Native insect pollinators are an intrinsic part of our native biodiversity and provide an important service that benefits many animals as well as plants. Pollination produces fruits and seeds that can provide food for birds and mammals.
- Ensuring that urban areas provide good habitat could potentially improve the connectivity of high quality pollinator habitat across the wider landscape.
- Hobby beekeepers maintain hives of managed honeybees in urban areas as well as rural landscapes, so towns and cities need to provide sufficient resources for urban honeybees as well as wild pollinators.
- Many members of the public appreciate flower-filled gardens and amenity spaces, where insect pollinated flowers contribute to the variety of colours and forms.

What do we know about insect pollinators in urban areas?

Bees, flies, wasps, beetles, butterflies and moths can all act as pollinators of crops and wild flowers in the UK. All of these insects can be found in urban areas.

- Pollinators can provide an important pollination service for urban crops.
- Urban areas in the UK contain similar numbers and diversity of pollinators compared to farmland and natural habitats.
- Although the evidence is mixed, some pollinator groups appear to be more sensitive to urbanisation than others. For example, generalist bees (those feeding on a wider range of flowers) appear to be less affected by urbanisation than more specialised bees and hoverflies.
- Urban areas include private gardens, allotments, urban nature reserves and public green space such as parks, amenity grassland and road verges, as well as areas with limited vegetation, including roads, pavements and car parks. Different land uses vary in the numbers and diversity of flowers and their suitability for pollinators. For example, allotments and gardens have been found to contain high numbers and diversity of pollinators.

How can urban areas be improved to benefit insect pollinators?

Research has shown that a number of interventions could benefit insect pollinators:

- Increasing the quantity of suitable pollen- and nectar-rich flowers can provide more food for pollinators. Pollinators also require a range of other resources, and this depends on the insect group, eg suitable nesting sites for bees and wasps; particular (native) plants for larval stages of some insects such as butterfly and moth caterpillars to feed on.
- Although evidence is limited on the best urban management practices for pollinators, interventions widely used in farmland and nature reserves could also help support pollinators in towns and cities, for example habitat creation similar to flowering margins used in agricultural fields.
- Planting flower meadows in public parks and other urban green spaces increases the amount of nectar and pollen available and attracts a wide diversity of insects. However further research is needed to confirm that creating urban flower meadows leads to an increase in pollinator populations over time.
- Less intensive mowing (ie less frequent and/or higher cut height) can result in more flowers and greater numbers of insect visits.
- Green roofs containing diverse floral mixes can attract a range of native bee species, as demonstrated by research in the United States.
- Little is known regarding the effects of pesticides on pollinators in urban settings, but studies are emerging that suggest pesticide use in gardens may have a detrimental effect on bumblebees and butterflies.

- “Bee hotels” (also known as trap nests or nest boxes) that provide additional nesting sites for cavity-nesting solitary bee and wasp species may boost nesting sites in urban areas, although evidence of whether these actually boost bee populations is lacking.



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What do urban pollinators need?

Urban gardeners and land managers can help by:

- Thinking about pollinators and selecting plants that provide good sources of pollen and nectar to ensure a continual supply from spring to autumn.
- Planting flowers with a range of shapes and colours, as different pollinators prefer different flower types, and also selecting single rather than double flowers, as the latter contain less pollen and nectar.
- Mowing parks, road verges and other amenity grassland less frequently and giving flowers a chance to bloom.
- Considering adding bee hotels to sites to increase nesting sites for solitary bees and wasps.
- Reducing the use of pesticides where possible, as this could benefit both pollinators and other insects.
- Including green roofs in planning proposals if appropriate and planting these with a wide range of native species.

National and local policymakers can help by:

- Ensuring that Local Planning Authorities know which threatened pollinators occur in their area and which habitats are important, so that they can check whether they have been considered in the planning process.
- Designating urban areas which are high value for pollinators as nature reserves and ensuring management plans recognise forage and nesting needs.

- Adding pollinators to urban Biodiversity Action Plans.
- Ensuring existing gardens and allotments are protected and new ones are included in new developments.
- Recognising that brownfield sites can contain high biodiversity of insects and plants and looking for ways to maintain these if sites are developed.
- Ensuring that local authorities have access to expert advice on pollinators in regard to planning legislation.
- Promoting the creation and connectivity of nectar- and pollen-rich habitats in urban areas and across the wider landscape; eg working with Highways England and Network Rail to improve road verges and railway edges as these provide important connecting habitat.
- Helping to promote emerging initiatives such as Green Infrastructure partnerships, Green Flag Award Schemes, Local Nature Partnerships, Nature Improvement Areas, walking for health initiatives and biodiversity off-setting.
- Developing a pollinator indicator under the planned Biodiversity 2020 monitoring strategy, and establishing a UK-wide standardised monitoring programme in urban and non-urban habitats, so long-term changes in populations can be recorded and success of pollinator conservation activities monitored.
- Working with land managers eg local authorities, private householders, businesses, community groups and NGOs at national and local level to promote knowledge and education about insect pollinators.

Further information

This Policy and Practice Note was written by Dr Katherine Baldock, Dr Mark Goddard, Prof Bill Kunin, Prof Simon Potts, Prof Graham Stone and Prof Jane Memmott drawing on research from the Urban Pollinators project, part of the Insect Pollinators Initiative. The Insect Pollinators Initiative was funded by the Biotechnology and Biological Sciences Research Council, the Natural Environment Research Council, the Department for Environment, Food and Rural Affairs, the Scottish Government and the Wellcome Trust under the auspices of the LWEC programme.

Useful resources:

Insect Pollinators Initiative website: www.insectpollinatorsinitiative.net

The whole series of LWEC Policy and Practice Notes, including those drawing on the Insect Pollinators Initiative, may be downloaded from [http://www.nerc.ac.uk/research/partnerships/lwec/products/ppn/Urban Pollinators project website: www.bris.ac.uk/urban-pollinators](http://www.nerc.ac.uk/research/partnerships/lwec/products/ppn/Urban%20Pollinators%20project%20website)

Defra's National Pollinator Strategy:

www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england

The Welsh Action Plan for Pollinators:

<http://wales.gov.uk/topics/environmentcountryside/consmanagement/conservationbiodiversity/action-plan-for-pollinators/?lang=en>

Baldock KCR, Goddard MA, Hicks DM, Kunin WE, Mitschunas N, Osgathorpe LM, Potts SG, Robertson KM, Scott AV, Stone GN, Vaughan IP, Memmott J. (2015) Where is the UK's pollinator biodiversity? The importance of urban areas for flower-visiting insects. *Proceedings of the Royal Society B* 282: 20142849.

Bates, A. J., et al. (2011) Changing Bee and Hoverfly Pollinator Assemblages along an Urban-Rural Gradient *PLoS ONE* 6(8): e23459. doi:10.1371/journal.pone.0023459

Hernandez JL, Frankie GW, Thorp RW. (2009) Ecology of Urban Bees: A Review of Current Knowledge and Directions for Future Study. *Cities and the Environment* 2:3-15.

<http://digitalcommons.lmu.edu/cate/vol2/iss1/3/>

Royal Horticultural Society "Perfect for Pollinators" list of plants: www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators

Bumblebee Conservation Trust: <http://bumblebeeconservation.org/>

Defra's Bees' Needs website: www.wildlifetrusts.org/Bees-needs

B-Lines projects are creating corridors of wildflower-rich habitat across the UK countryside and urban areas www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines

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