Cities

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Flutter bye: where did all the city butterflies go?

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The purple plumes of railway-side buddleias are emptied of insects. A single white butterfly is dancing, alone, in a grassy park. Suburban gardens are unvisited by red admirals or small tortoiseshells.

The disappearance of butterflies from the British countryside over the past half-century is well documented, but a new study warns that they are also vanishing from UK cities, more quickly than in rural areas.

Researchers examined 28 common British butterfly species over 20 years to 2014 and found their numbers fell by 69% in urban areas compared to a 45% decline in the countryside.

Some species are disappearing alarmingly quickly: small heath butterfly numbers fell by 78% in urban areas compared to 17% in rural areas; the small copper declined by 75% in urban areas, and 23% in rural areas. Because they are so well studied, butterflies are an indicator species: when they are declining, so too will thousands of less visible - but equally important - pollinators and other insects.

The causes of butterflies' disappearance from the countryside is relatively well understood by scientists, who blame a combination of industrial agriculture, neglect of forests and climate change. But what's causing the butterflies to vanish from cities?

The first and most easily understood cause is habitat loss. Green cities are becoming grey. The number of front gardens totally paved over has tripled from 1.5 million to 4.59 million between 2005 and 2015, according to the Royal Horticultural Society. A London survey found that the capital is losing the equivalent of two-and-a-half Hyde Parks of greenery a year from its domestic gardens - about 3,000ha (7,410 acres). Successful applications to councils for dropped kerbs to allow cars to drive over them (where gardens are converted into parking) increased by 49% between 2013 and 2015.

▲ The number of small heath butterflies has fallen by 78% in urban areas. Photograph: Alamy

The paving over of gardens was blamed in several press reports for the decline of urban butterflies. But there's no simple, single cause, according to the co-author of the joint study by Butterfly Conservation, Kent university and the Centre for Ecology and Hydrology. "There are a lot of different factors. Paving over gardens is definitely a problem but it's not the only one and probably not the biggest either," says Prof Tom Brereton of Butterfly Conservation.

Many larger gardens have been divided up and built on in recent years, and changing garden fashions are reducing the butterfly-friendly habitat. "Generally there's more artificial space

now in your average garden with decking and barbecue areas," says Brereton, who points out that gardeners also use more pesticides per area than farmers.

More widely, brownfield sites - an area of land previously used or built upon, which are some of the best insect habitats - are increasingly targeted for development. Austerity has meant that local councils' contractors scalp verges and green areas once or twice a year, destroying wildflowers and the insects that depend on them.

"River banks and roadsides are just cut down to a bowling green as efficiently as possible to save money. You'd think all the messages about wildlife verges would have got through, but it still hasn't really," says Brereton. "Countryside services that local authorities provide have collapsed in some areas and been drastically reduced in others."

▲ Red admiral butterflies are seen more frequently in cities than other species. Photograph: Derek Harris/Alamy

This loss and fragmentation of habitat particularly affects insects that aren't as strong fliers and are less able to find new sources of food, such as the small heath and small copper. (The powerful flying red admiral's urban decline has been less pronounced than other species.)

Brereton cites two other major factors which are causing urban butterflies to disappear. Climate change appears to be exacerbated by the urban heat island effect in towns and cities, and so butterfly species struggle to adapt to warmer winters – a common problem for a number of British species – are finding it even harder in urban spaces.

" Right through Brighton there's as much diversity as you'll find on the

Finally, the impact of pollution, particularly from diesel-powered vehicles, is unknown but may be more significant than scientists suspect. The sheer volume of traffic is leading to higher nitrogen deposition, which has been linked to butterfly declines in the Netherlands. Researchers found that it led to a decline in plants

remotest downland valley
Michael Blencowe

that prefer less fertile soils. The butterflies suffering the biggest UK declines, the small copper and small heath, both prefer plants that grow in low-fertility soil. Nitrogen deposition also reduces the quality of plants. In effect, said the Dutch scientists, it turns plants into junk food for insects.

Butterfly Conservation is now refocusing its efforts on towns and wants the Department for Environment, Food and Rural Affairs (Defra) to adopt the annual urban butterfly data as an indicator of environmental health, and act to stop further declines. “We want to do more for butterflies in urban areas,” says Brereton. “We’re looking to develop more urban projects and engage more people.”

Some cities are already engaged - and some urban areas even offer better butterfly-watching than the surrounding countryside. Michael Blencowe, co-author of The Butterflies of Sussex, a new “atlas” of butterfly sightings in the region, says that rare butterflies including the white-letter hairstreak and migratory swallowtails from continental Europe and long-tailed blues are more easily found in Brighton than in rural parts of the county.

“Right through Brighton there’s as much diversity as you’ll find on the remotest downland valley,” he says. “Some of the most exciting sightings for our atlas came from people’s back gardens.”

The white-letter hairstreak lives on elm, and while Dutch elm disease wiped out most elm trees in the 1970s, many survive in Brighton. “This is quite a rare butterfly and people have it in their front gardens in Brighton,” says Blencowe. “If you want to see them, you can simply stand by the Royal Pavilion.”

▲ Pupils of the Dorothy Stringer High School and teacher Dan Danahar search for the rare small blue butterfly in Brighton's butterfly haven. Photograph: Frank Baron/The Guardian

Brighton is unusually good for butterflies because of its geology: the city is built on the chalk downs, and chalk grassland is one of the best places for wildflowers and the insects that depend upon them. In such places, gardeners can have a real impact. "All you've got to do in Brighton is go out with a shovel and spend half an hour scraping the topsoil off your back garden and you've created one of the UK's rarest habitats [chalk grassland] in your back garden," says Blencowe.

Brighton resident and teacher Dan Danahar has gone much further. Nine years ago, he created a "butterfly haven" in the grounds of Dorothy Stringer High School - exposing the chalk beneath the standard lushly grassed playing fields and getting pupils to plant wild flowers. Unexpectedly, this little oasis swiftly attracted Britain's smallest butterfly, the small blue, which is rare and previously thought not particularly adept at navigating cities.

"We've got unbelievable numbers of common butterflies such as the common blue and small blues all over the site now," says Danahar.

▲ The holly blue, a frequent visitor to gardens in southern England. Photograph: Andy Seely/Butterfly Conservatio/PA

After the success of Danahar's havens, he persuaded the Brighton and Hove Council to adopt his vision. The council has created 25 "butterfly havens" across the city. You can see one, at White Hawk, from Google Earth. What the satellite pictures won't show are the rare Adonis blues and silver-spotted skippers which fly on the site - two species which were so rare in the 1980s it was feared they would go extinct.

According to Danahar, it doesn't cost a council much to create such havens: "Get one of your guys with a bulldozer to scrape the turf off the chalk and put some local wild flower plugs in -

the kids put them in, and it's a whole community-wide engagement." Danahar will soon create a new haven on a steep piece of Brighton seafront. He plans to plant nectar and food plants for migratory insects such as broadleaved everlasting pea - the foodplant of the long-tailed blue. "Think of the ecotourism potential - people travel from Scotland to see this butterfly," he says.

In 2014, Brighton was made a Unesco World Biosphere, a conservation designation which helps protect its important chalk grassland, shingle beaches and undersea chalk reefs. Then there's the fact its council (Green party controlled from 2011 to 2015) has historically been engaged in environmental issues. Has this local political focus benefitted butterflies?

"I think it has. The whole biosphere designation has helped," says Blencowe. "I always hear complaints about the council, as anywhere, but they put these butterfly banks in. They don't look great compared to rows of begonias but they are working and there are enough people in Brighton pushing for them and enjoying them. Other urban areas aren't going to be chalk grassland but just planting nectar-rich flowers will attract lots of butterflies and bees."

Some councils are getting the message: Dorset, Devon, Cornwall, East Sussex and Bristol are among councils to have adopted "pollinator action plans". Burnley borough council estimates it is saving £58,000 per year by reducing grass-cutting to benefit wildlife. Such policies are popular too; according to a recent survey for Friends of the Earth, 81% of the public support plans to cut roadside verges and parkland less often to help wild flowers and bees.

Danahar is convinced that people can help many more cities become hotspots for butterflies and other wildlife. "We are putting a band aid back on the landscape and enabling this species to spread. It's not rocket science but you need the will and you need the knowhow. It's not about glass half empty or glass half full, we've simply got to fill that glass up, and create new habitat."

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