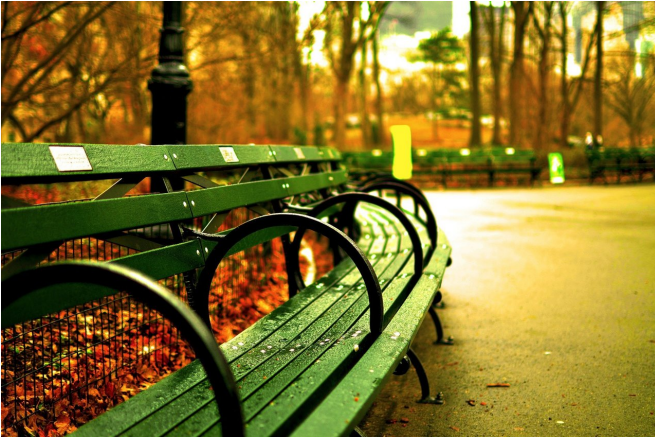


High human population density negative for pollinators

25 August 2020



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Population density, and not the proportion of green spaces, has the biggest impact on species richness of pollinators in residential areas. This is the result of a study from Lund University in Sweden of gardens and residential courtyards in and around Malmö, Sweden.

The result surprised the researchers, who had expected that the vegetation cover would be more significant.

"We have found that, in cities, the higher the population density, the fewer species of wild bees and hoverflies we find in gardens and residential courtyards. We also see that areas with enclosed courtyards and tall buildings have fewer species of wild bees than areas with semi-detached and detached houses, even when there are large green spaces between the buildings," says Anna Persson, one of the researchers behind the study.

It is believed that the result is due to two things, firstly, that tall buildings and enclosed courtyards constitute physical barriers for insects and secondly, that green environments in densely

populated areas often are insufficient for pollinators, as they may only consist of for example a lawn and a few ornamental shrubs.

"Urban green spaces often look very different and the quality can vary a lot. A [space](#) can be green and still be a poor habitat for pollinators. In multi-family areas these spaces are usually simplified and maintained by an external contractor, compared to detached houses where there is often personal engagement and a greater variation of both plants and management practices," says Anna Persson.

Another interesting discovery the researchers made was that urban gardens contain different species of wild bees than those found in agricultural landscapes.

"Therefore, the [city](#) complements the countryside," says Anna Persson, who contends that this is important knowledge, particularly in regions with intense farming, as this means that the city constitutes an important environment for the regional diversity of bees. It also means that measures for the conservation of bees are needed both in urban and rural areas, to reach different species.

For hoverflies, however, the result was different—the species found in [urban areas](#) were just a fraction of the species in [rural areas](#), probably due to the fact that hoverfly larval habitats are scarcer in the city, for example, aquatic environments and plant debris.

Urbanization is one of the main causes of biodiversity decline. This is due both to urban land expansion and to denitrification through infill development. The researchers wanted to study which factor affected the species richness of pollinators to the greatest extent—population density or vegetation cover. In addition, they wanted to find out if the built urban form had any effect on the

species richness and what residential areas with high diversity of pollinators look like. The study was carried out by comparing species richness in areas with varying degrees of population density and vegetation cover—in total, forty gardens and courtyards across nearly all of Malmö were studied. Researchers also made comparisons between gardens in the urban areas and the intensively farmed agricultural landscape surrounding Malmö.

"Pollinators are interesting and important to study in cities as they are crucial to the functioning of the ecosystem and, in addition, they are necessary for us to be able to achieve good harvests in our vegetable gardens and community allotments," says Anna Persson.

She hopes the study will contribute new knowledge about how to plan and build cities in a way that reduces their negative impact on [species](#) richness.

"We show that the urban form is significant. By reducing the physical barriers between residential courtyards and by combining different kinds of built environments it is possible to benefit pollinators. In addition, we demonstrate that there is scope for improvements to the existing green spaces, particularly in areas with multi-family buildings. Green spaces in these areas are often of low quality, both for biodiversity and for human recreation. One way to upgrade them is to let them grow a little more 'wild,' with less intensive maintenance and more native plants," she concludes.

More information: Anna S. Persson et al. Wild bees and hoverflies respond differently to urbanization, human population density and urban form, *Landscape and Urban Planning* (2020). DOI: [10.1016/j.landurbplan.2020.103901](https://doi.org/10.1016/j.landurbplan.2020.103901)

Provided by Lund University

APA citation: High human population density negative for pollinators (2020, August 25) retrieved 1 December 2020 from <https://phys.org/news/2020-08-high-human-population-density-negative.html>

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