

Ecologists use 70-year-old pressed plants to chart city's vanishing native flora

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More than half of the world's population now lives in cities, yet we know little about how urbanization affects biodiversity. In one of the first studies of its kind, ecologists in Indianapolis, USA have used 70 year-old dried plant specimens to track the impact of increasing urbanization on plants. The results are published this week in the British Ecological Society's *Journal of Ecology*.

Lead by Dr Rebecca Dolan, director of the Friesner Herbarium, Butler University, the team examined 2,800 dried plants collected around Indianapolis before 1940 and compared these with plants they and their students found at 16 field sites between 1996 and 2006.

They discovered that increasing [urbanization](#) has wrought major changes to Indianapolis's [plant species](#). Although the city supports a similar number of plant species – around 700 – today's flora has fewer native plants and more non-native species, which have been introduced from other parts of the world and are now spreading on their own.

The study found that over the past 70 years, Indianapolis's native plants have been lost at a rate of 2.4 species per year, while over the same period 1.4 non-natives arrive each year. According to Dolan: "This study shows that our flora is becoming less distinctive."

Plants now lost to Indianapolis include Queen-of-the-prairie (*Filipendula rubra*), a member of the rose family with fantastic wands of pink flowers. It was last found growing in a damp spot by the Water Canal at

52nd Street in July 1935. Another loss is the Virginia bunchflower (*Melanthium virginicum*), a member of the lily family with striking stalks of white flowers.

Arrivals include the invasive Japanese knotweed (*Fallopia japonica*) and Amur bush honeysuckle (*Lonicera maackii*). "Japanese knotweed was brought to our area as an ornamental. It spreads readily by seed and by root sprouts, forming thickets that choke out native species," says Dolan.

"Amur bush honeysuckle was once promoted by the USDA's Soil Conservation Service for erosion control and wildlife food, but we now know it does neither. Instead, it has spread and become a pest plant, covering the banks of many of the city's streams and woodland edges, and land managers spend a lot of money eradicating it."

The study has important lessons for cities, biodiversity and the potential dangers posed by non-native species.

Because so many of us now live in cities, urban floras are becoming increasingly important. According to Dolan: "As cities continue to grow, urban green spaces are becoming important refuges for native biodiversity and for people. In coming decades, most people's contact with nature will be in urban settings, so the social importance of urban plants has never been greater."

"A clear message for the future is to be careful when planting non-native material, especially in great numbers, due to the likelihood of introduced non-native [plants](#) becoming pests," she says.

More information: Rebecca W. Dolan, Marcia E. Moore and Jessica D. Stephens (2011), 'Documenting effects of urbanization on flora using herbarium records', [doi: 10.1111/j.1365-2745.2011.01820.x](https://doi.org/10.1111/j.1365-2745.2011.01820.x), is published in the *Journal of Ecology* on 18 March 2011.

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