

# Wildflower patches as restoration measures for pollinators: Investigating ecosystem functions in urban landscapes

**Topics:** Urban ecology, movement ecology, landscape ecology, pollination, ecosystem functioning, urban ecological restoration

**Species:** Solitary wild bees, solitary wasps, parasites, parasitoids



## Context

Wild bees and other pollinators belong to a group of insects that are evidently decreasing in their abundance and diversity worldwide. **Urbanization** is one of the major drivers of global land use change which variably influences **the occurrence and diversity** of different groups of pollinating insects. Non the less, cities provide suitable habitats for different pollinator species and can be considered, in some cases, as **refuges**. As urban habitats are oftentimes rare and fragmented in their distribution, the question rises how isolated pollinator populations can be (re-) connected within the urban matrix, which environmental factors play a role in their **movement, distribution and diversity** and how especially **food habitats can be designed or restored** to meet the needs of a variety of different city dwelling pollinators.

## Project

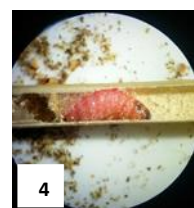
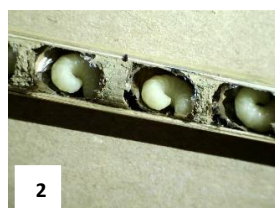
In the project of the “**Blooming Bands**”, we are testing a **city-wide blooming-band network** to promote pollinator diversity and movement. We will measure local effects of blooming patches **on wild bees, bumblebees, hoverflies and solitary wasps** within differently urbanized surroundings. Furthermore, the wildflower plots will be examined for their effects on **pollination success** as a major **ecosystem function**.

## Thesis: Effects of restored urban roadside green on trap nesting wild bees, wasps and their enemies

In this thesis, we want to test the effects of the blooming wildflower patches on **the hypogean pollinator abundance and diversity, predation and parasitization rates** and their overall **reproductive success**. To evaluate the effects of the wild flower patches on trap nesting wild bees and wasps, we use artificial nests. The method of using **trap nests** as a sampling technique is a rather young but efficient way of investigating **pollinator occurrence and habitat selection**. We will use a set of **130 trap nests** in the city of Munich which are covering different grades of urbanization. After field work, samples will be analyzed in the lab concerning abundance and diversity of trap nesting species and their enemies. Statistical analysis will allow insights into host-parasite interactions, pollinator reproductive success and how these variables are influenced by wildflower patches and further landscape parameters.

### Requirements

- Fieldwork in summer/autumn 2021
- Basic knowledge in statistical analysis in R
- Advantageous: Experiences in species identification of plants and/or insects, experiences in GIS applications and analysis
- **Driver's license** and car available



- 1: Nest of *Megachile spec.*
- 2: Nest of *Osmia adunca*
- 3: Larva of solitary wasp *Passaloecus spec.*
- 4: Predatory larva of *Trichodes apiaris*

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