

## POLLINATORS ET AL.

### POLLINATOR StreETs as vitAL connections to maintain functional urban areas

#### Abstract for the general public

The first human settlements were established around 8.000 years ago during the Neolithic age. Even if only around 0.05% of human history was spent within urban areas, cities have changed drastically the land use. The strongest land changes have been recorded after the industrial revolution. Those changes have had large impacts on biodiversity, indeed urban expansion is considered one of the global threats to biodiversity. However, conserving biodiversity is a major 21st-century challenge (EU Biodiversity Strategy for 2030).

In recent years pollinators for their unreplaceable role in ecosystems have been in the spotlight of the general audience and researchers. 87% of the world's wild plants are pollinated by animals and an estimated 70% of global crop species depend on pollination. The pollinator communities vary significantly across Europe but in all countries, pollinator declines have already been registered. Land-use changes have been considered one of the main drivers of pollinator decline, and urbanization is a major driver of land cover change worldwide. To conserve pollinators, it is essential to be also focused on urban areas that on one hand can be a threat to pollinators but on the other hand can support pollinators, even more than arable fields. Indeed, urban habitats can contain remarkably high pollinator species. However, to conserve pollinators, it is not sufficient to increase green spaces if they are not connected to each other. Thus, it is essential to ecologically connect urban green areas to avoid isolated populations that contribute to species decrease.

Communities and mobility of pollinators within urban areas are crucial to maintaining green and ecologically sustainable cities through pollination services. In this project, we aim to understand which landscape and local environmental variables affect communities and the mobility of wild pollinators (butterflies, bees, and hoverflies) along road verges in urban areas and how green area connectivity influence pollination services. Communities, mobility of pollinators and pollination services change across Europe in relation to biotic and abiotic variables. Thus, we will evaluate these aspects in three urban areas in three countries in Europe, ranging from north to south: Uppsala (Sweden), Poznań (Poland) and Turin (Italy). Indeed, the ultimate goal of the project is to define optimal management actions that would enhance pollinator mobility and pollination across Europe.

The project will be divided into 5 different tasks, four research tasks (A-D) and one outreach task (E):

- A) Investigating pollinator communities along road verges;
- B) Evaluating mobility of pollinators along road verges, in collaboration with the Swedish University of Agricultural Sciences (SLU, Sweden);
- C) Estimating pollen transport, in collaboration with the University of Milan Bicocca (UniMIB, Italy);
- D) Estimating pollination along a gradient of connectivity within urban areas, through exclusion experiments and using pollinator video and acoustic recordings in collaboration with the University of Turin (UniTO, Italy).
- E) Outreach activities (media coverage, activities with citizens along road verges, public events and a final document for policymakers).

For the first time, this project will evaluate pollinator mobility along road verges and associated pollination services within urban areas. Thus, this project would increase the knowledge of which biotic and abiotic factors affect pollinator presence and mobility and their associated pollination. Once established which factors affect pollinator presence and ecological functions provided by them, it would be possible to suggest road verge management within urban areas to favor pollinators and pollination. Considering that the communities of pollinators change across Europe and so its associated pollination services, we will conduct research from north to south of Europe. Then, it will be possible to design management suggestions valid across Europe.