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Pavement Pollinators: Discovering the secret lives of wild city bees

Supervisors:
Prof. Bastiaan Star
Marianne S. Torvanger (PhD)

Preferred background of candidate(s)
We are looking for BSc & Master students with the following background

- background in ecology/biology
- experience/interest in fieldwork
- interest in biodiversity research
- experience/interest in entomology and biological species identification
- interest in public outreach

Number of available projects
One project for 3 students

Preferred project period
8 weeks in the period April 1st until mid-August 2024



Figure 1. Location of newly established flower meadows (yellow patches) within 2.5km of the Munch Museum in the center of Oslo. The establishment of the flower meadows around "The Mother" were financed through Kulturetaten Oslo by the City of Art Collection.

Project description
Insects provide crucial ecosystem services, by pollinating commercial crops and wild flowers, by controlling pests, by recycling biological material, by creating healthy soils, and by being food for many larger animals. Without insects, ecosystems simply cease to function. Insects have had to deal with increasingly fragmented landscapes that have been devastated by the agricultural expansions of the 20th century. Such landscape fragmentation –combined with the impacts of climate change– affects many insect species simultaneously. Worryingly, several observations indicate that the abundance of insects has declined, possibly by an astounding 75% during the past 50 years. People are getting more aware of these problems leading to efforts to reverse such declining pollinator trends in the local environment. **Bymiljøetaten Oslo and Kulturetaten by the City of Art Collection have specifically created flowerbeds throughout in Oslo at different locations with an aim to improve wild bee abundance, biodiversity and connectivity between habitats.** For instance, at Tracey Emin's statue "The Mother" in front of the Munch Museum (Figure 1). Oslo is relatively warm, near the coast and comprises many different habitats and therefore hosts a remarkable diversity wild bee species. Nevertheless, there is little information about what bees are present in the city and how they are connected from habitat to habitat and how this varies from year to year. *Bymiljøetaten* does not have the scientific expertise or funding to assess bee biodiversity and connectivity. In 2024, we *(NINA/UiO)* performed a pilot survey project during late June, July and August whereby we performed capture/recapture experiments (e.g. *Figure 2*) to assess wild bee biodiversity and mobility in Oslo.

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Such assessment of bee mobility had not been done in urban environments in Norway before. The results from this survey will be directly communicated to *Bymiljøetaten* to evaluate the ecological impact of their work, to better assess new locations for additional flowerbeds and to perhaps change the types of flowering plants that are required to best improve bee biodiversity and abundance. **Given that urban areas make up an ever-greater part of the world's global environments, communicating how we can improve biodiversity in such areas, protecting red-listed species, is of increasing importance**. Nonetheless, so far, the pilot project has investigated a limited number of sites in the city, for a single year, and only for the later part of the flowering season. We still lack biodiversity estimates of greater parts of the city and for the early season, which is ecologically important, as many solitary bees are only active early in the season.



Figure 2. Captured, marked and released bumblebee (Bombus lapidarius) on red clover in Oslo, 2024. Photo: Marianne S. Torvanger

Moreover, we now want also use these research activities as a platform to integrate additional public outreach activities to improve the communication of biodiversity research. This summer project aims to take advantage of the joint integration of these art-installations with flowerbeds and their associated biodiversity right in the centre of Oslo **as an opportunity to directly communicate the importance of biodiversity research towards an audience that is not necessarily seeking out such information**. These activities are therefore a fantastic opportunity improve the public outreach skills of UiO MSc candidates by active engagement of these candidates with the public during research activities.

What you will do:

You will do ecological fieldwork in the centre of Oslo and learn how to perform capture/recapture experiments of wild bees and bumble bees. You will learn to identify a number of common wild bee species and perform field surveys along established transects (*Figure 3*). It is only worth it to do this work in fine weather (Bees are only sufficiently active when the weather is nice) so we can guarantee sunny fieldwork conditions! This work is highly visible and there will be lots of opportunity to explain your work to the general public.



Figure 3. Example of detailed wild-bee sampling transects that have been established in Oslo during summer 2024.

This project will have a number of outcomes:

1) *Engage in field-based research activities in town*
2) *Obtain new data into insect diversity and their connectivity in dense urban areas.*
3) *Directly communicate the importance of biodiversity research to a wide local and international audience and acquire skills in public outreach communication*
4) *Obtain biodiversity insights for direct use by Bymiljøetaten* and *Kulturetaten Oslo about the ecological relevance of their work*

Collaborators on the project:

Dr. Markus Sydenham Norwegian Institute for Nature Research (NINA)
Lily Vikki (Kulturetaten, Oslo Kommune)
Bård Øyvind Bredesen (Oslo Bymiljøetaten)