Two unforeseeable circumstances justify the deviations from the original plan. First, despite our hard work and overall successful sampling, (our total number of specimens, 4870, exceeded our expectations, 3320), we only sampled enough individuals for two species (S. pipiens and M. florea). Indeed, although we caught the other two species (R. campestris and V. pollucens with (45 and 156 individuals, respectively)) and we could theoretically run the planned analyses on them, robust and conclusive research analyses would need more data points.

More focused sampling could be thought of as a solution. However, as our teams explored all habitats at different times of day, across the whole sampling period, we are confident that those two species are simply not abundant in urban areas, rather than this being a sampling bias or a lack of collecting skills. This is an unfortunate result, both for its implication about the conservation of those two species in the face of urbanization, and for our project. The literature is lacking about hoverflies as pollinators, and we plan to communicate this result (low abundance of those two species) in another scientific paper, although we cannot use the data from those species as originally planned.

A second unforeseeable issue that was completely out of our control is that the two species we caught in sufficient numbers are showing low genetic structure. While this is does not mean that we cannot analyze the data, the signal of the effect of different landscape features on pollinator movement and connectivity may be lower, making it harder to identify accurately the relationship between environment and ecological resistance. Alain Frantz and Julian Wittische (postdoc) have previous experience analyzing datasets with low genetic structure and we will use the latest methods to overcome this issue.

Both of those unfortunate circumstances point us towards changing the original plan to better fulfil the general objective, which is to better understand the landscape connectivity of pollinators.

To achieve this we believe propose the following three changes to the original plan for 2022:

1. We should not sample R. campestris and V. pollucens in rural study areas. Their low abundance makes it risky because despite focusing on urban areas in 2021, we covered a lot of peri-urban rural habitats and we are doubtful that they will be abundant even in remote rural areas.
2. We should not plan to sample S. pipiens and M. florea in rural study areas. Their low genetic structure in in urbanized study areas, which present very fragmented habitats, does not suggest that their structure would be higher in more homogenous (relative to anthopogenic distubances) rural landscapes.
3. We should instead focus on 2 new species of pollinators, which may give us more chance to detect a stronger genetic structure and lend itself better to fulfil the original objective. Choosing a species of another order/family, with different life history traits could be a solution. For this we suggest:
4. Andrena cineraria because many of our staff have experience catching it thanks to another unrelated project, because we already have access to hundreds of adequately stored specimens, and because its life history traits are very different from those of the two species we successfully sampled.

As a potential solution, and provided the FNR agrees, we will evaluate the feasibility of using another pollinator species based on the non-target species our teams netted/observed, inventories, citizen science and on the literature.

-Explain where your work deviates from the plan.

-Explain why this deviation was givenand how you will solvepossible delays or problems associated with this deviation.

-Will the objectives still be reached?

Please note that if a severe delay is expected a formal request for an extension must be submitted to and approved bythe FNR. Please also note that these requests will only be granted in exceptional cases where circumstances outside of the PIs control led to the delays.

(3362) and M. florea (1307)