

# Habitat requirements of the wild bee *Megachile lagopoda* in Sweden

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## Introduction

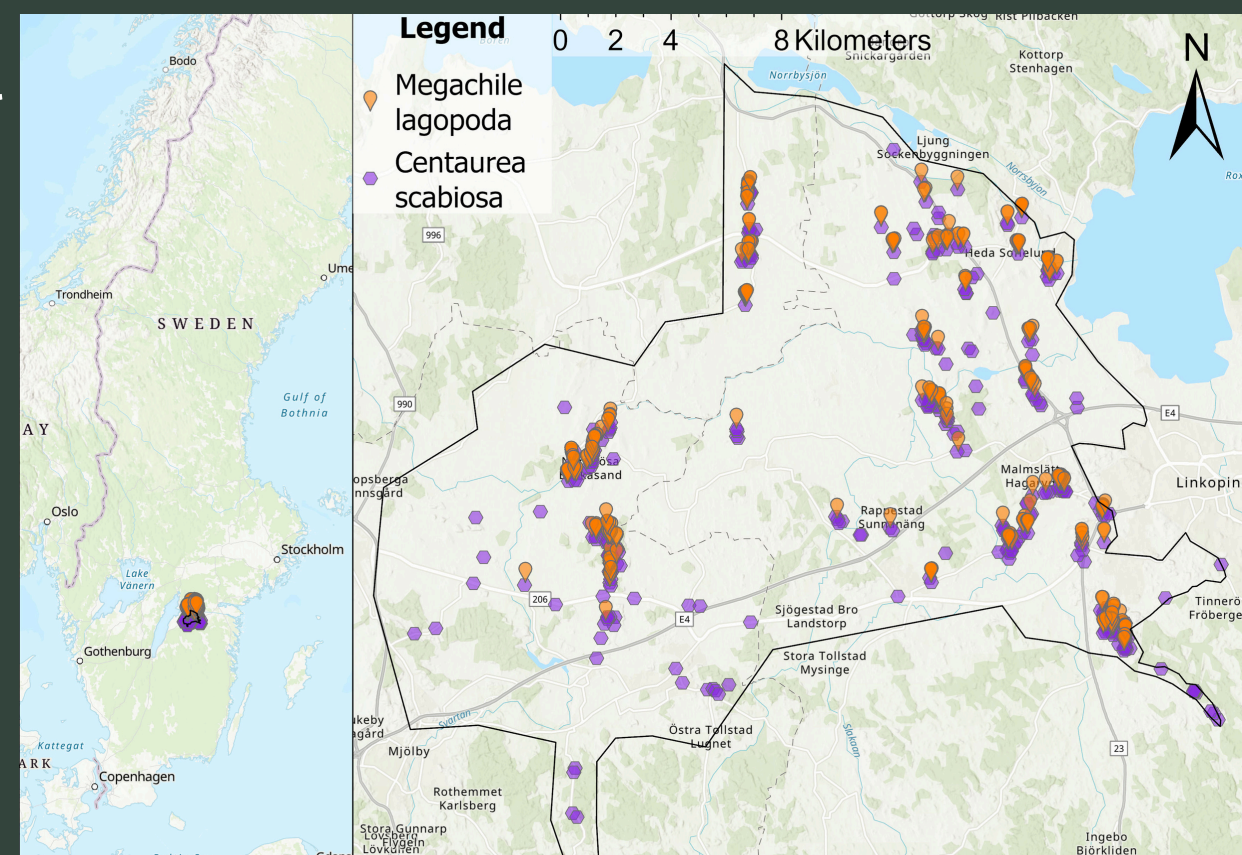
- Specialist pollinators face severe threats from **habitat fragmentation** and **landscape alteration**
- Megachile lagopoda*, Sweden's largest wild bee, **depends exclusively** on *Centaurea scabiosa* for pollen

### Aim:

- Investigate how host plant abundance, connectivity, and topography influence **bee distribution**

## Methods

- Study area: 400 km<sup>2</sup> in **central Östergötland**
- Field surveys: June-August 2024, 118 habitat patches
- Plant stalk counts** for patches
- Variables: host plant abundance, elevation range, connectivity
- Statistical analysis: Generalized linear models for **presence/absence** and **abundance**



## Results

### Occurrence

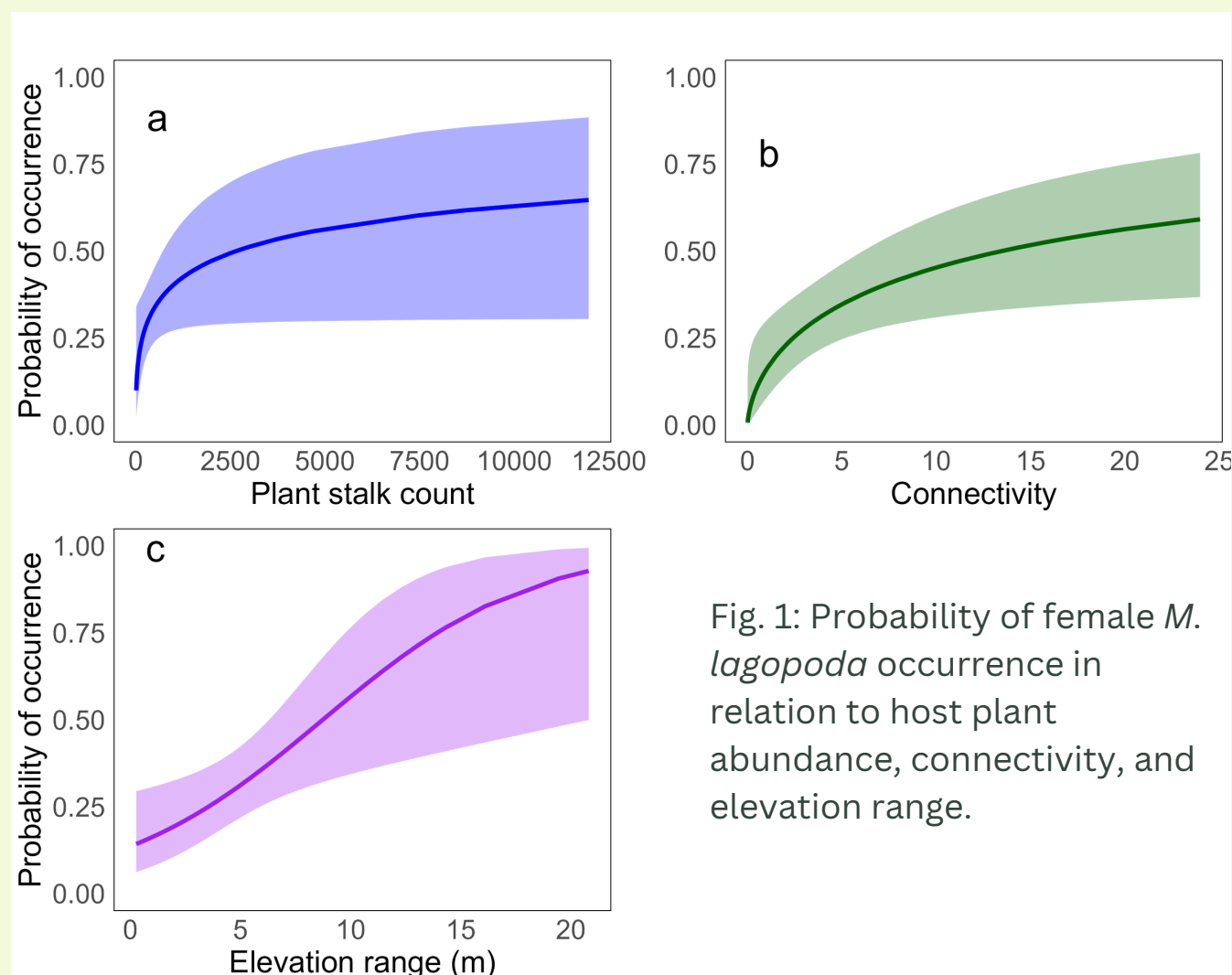


Fig. 1: Probability of female *M. lagopoda* occurrence in relation to host plant abundance, connectivity, and elevation range.

- More than 1,000 *C. scabiosa* stalks required for 50% probability of bee presence.
- Connectivity** significantly influences whether patches are occupied by females
- Elevation range** increases occurrence probability (21% higher odds per 1m increase)
- Isolated patches with abundant host plants often remained unoccupied by females

### Abundance

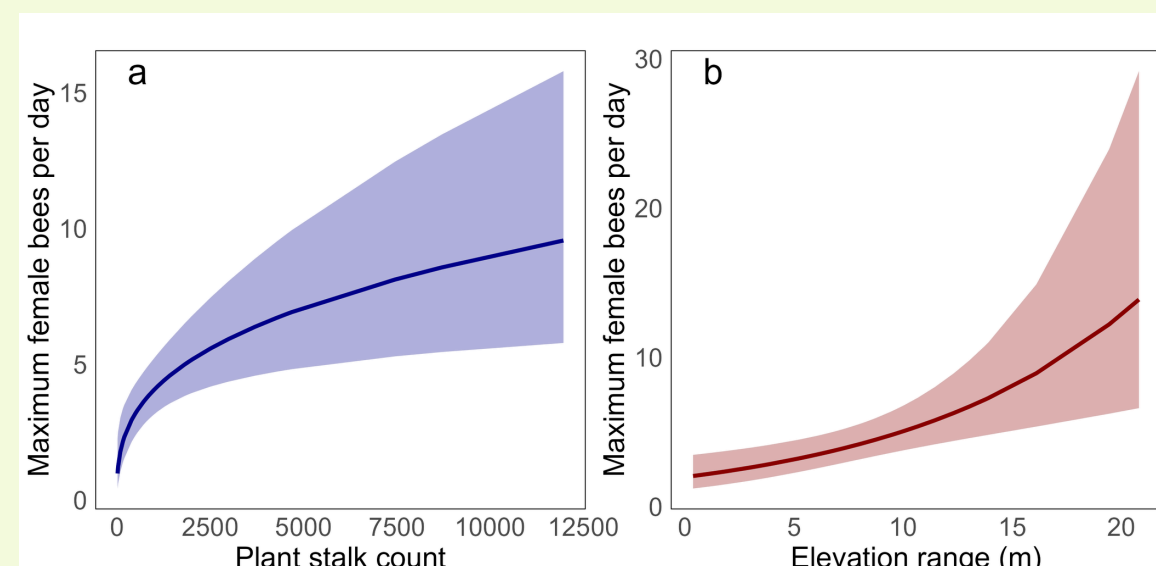


Fig. 2: Relationship between female *M. lagopoda* abundance and host plant abundance/elevation range in occupied patches.

- Host plant abundance** significantly affected female bee abundance
- Elevation range** directly influences **female population size** in occupied patches
- Topographic variation creates diverse microclimates supporting larger female populations
- Connectivity did not significantly affect female bee abundance within occupied patches

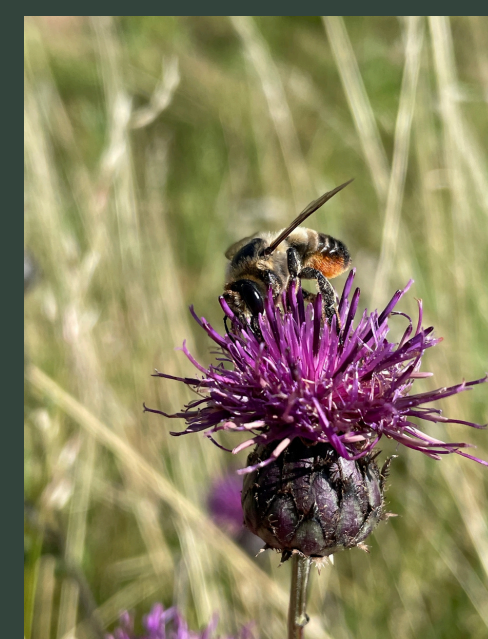


## Conclusion

- M. lagopoda* shows **clear threshold response** to host plant abundance
- Connectivity determines initial occurrence, while local resources shape population size
- Topographic variation provides essential microhabitat diversity

### Conservation recommendations:

- Protect patches with abundant *C. scabiosa* stalks
- Prioritize sites with varied topography
- Maintain **landscape-level connectivity** to ensure metapopulation persistence
- Consider both local **habitat quality** and **landscape structure** in management plans



*M. lagopoda* female



*M. lagopoda* male