



Phenology, landscape utilisation and monitoring of bumblebees



Linköpings universitet

Final thesis. International Master Programme Applied Biology 2006, Linköpings universitet.

Elin Jansson

Supervisor: Karl-Olof Bergman

Objective

To study...

- ... the phenology
- ... the importance of various landscape elements
- ... the impact of weather and daily variation

And...

- ... to improve monitoring methods

Method

Bumblebees were recorded using line transects.

- 6 landscape elements (3 replicates):

- Pasture
- Wood verge
- Ley
- Gravel road verge
- Field verge
- Asphalt road verge

- The following parameters were examined:

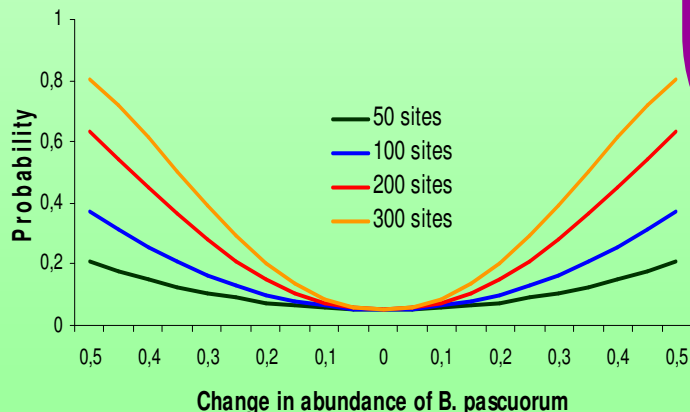
- Temperature
- % clouds
- Wind speed
- % of transect in sunshine
- Frequency of flowering plants

Results

- 70% of all bumblebees were found in the most **flower-rich** landscape elements:

- Wood verges
- Pastures
- Field verges

- Bumblebees showed a clear **seasonal variation** in habitat preferences.
- **No daily variation** in number of bumblebees was found.
- Bumblebees were **indifferent to weather** conditions.
- **Large scale** monitoring with many visited sites is necessary to detect a significant change in abundance.



Probability at which a certain change in abundance of *Bombus pascuorum* can be discovered at different number of sites.

Conclusions

- Bumblebees require...
...a diverse landscape
...flower-rich landscape elements
- Monitoring can be performed...
...over the whole day
...also in poor weather
- To detect a significant change in abundance...
...large-scale monitoring is necessary

