Threats to UK Insect Pollinators:

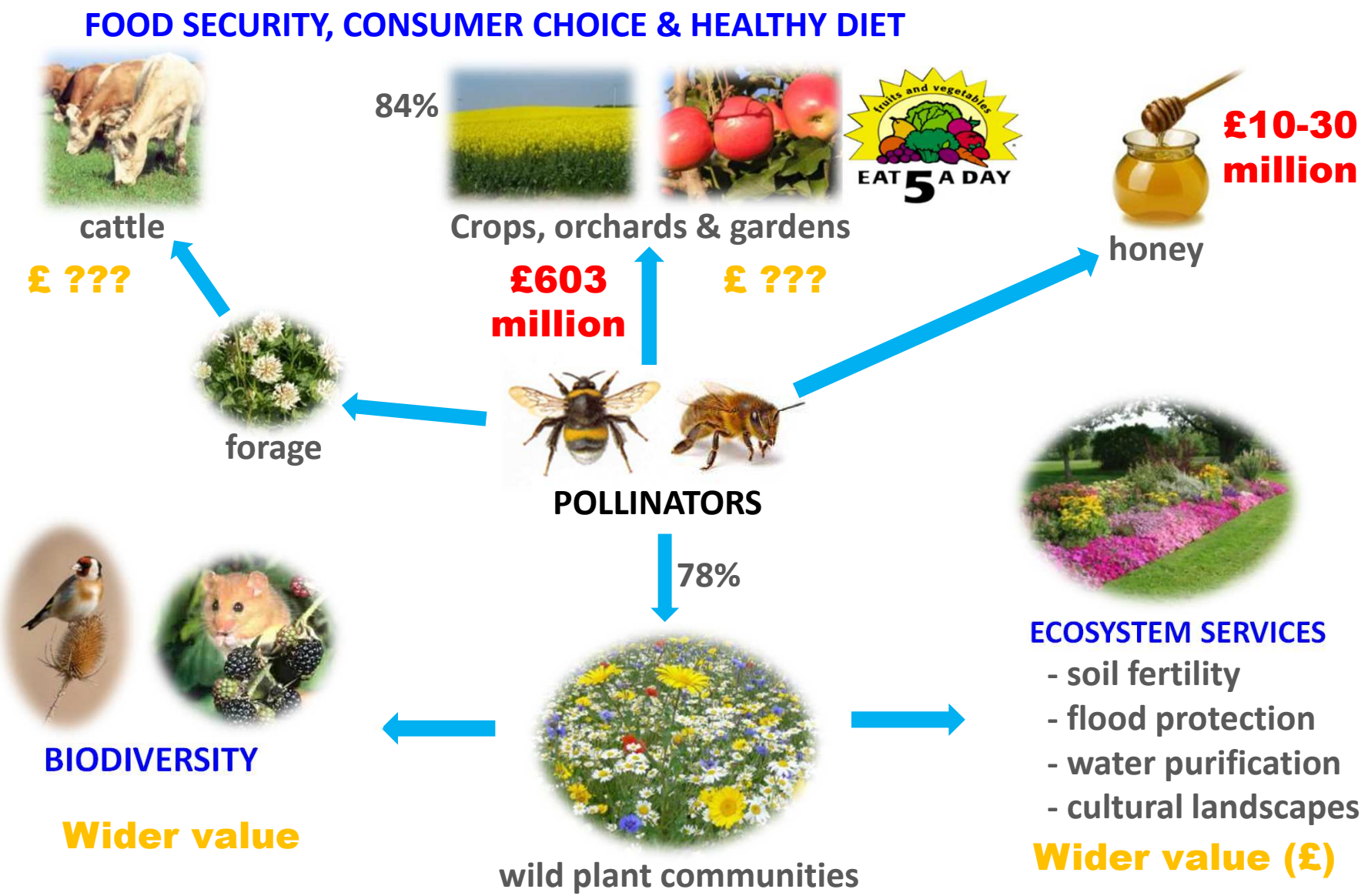
Challenges for Research

Prof. Simon G. Potts

CENTRE FOR food security

University of Reading

Multiple values to society



Status of honeybees

- Changes in colony numbers (1985-2005):
  - Europe – 16% decline
  - England – 54% decline
- Beekeeper numbers have also declined
- Recently numbers of hives and beekeepers increasing

Potts et al. (2010) ***J. Apic. Res.***

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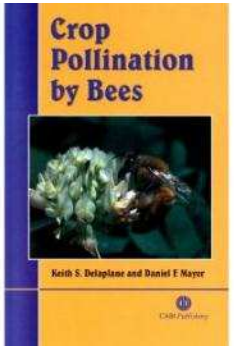
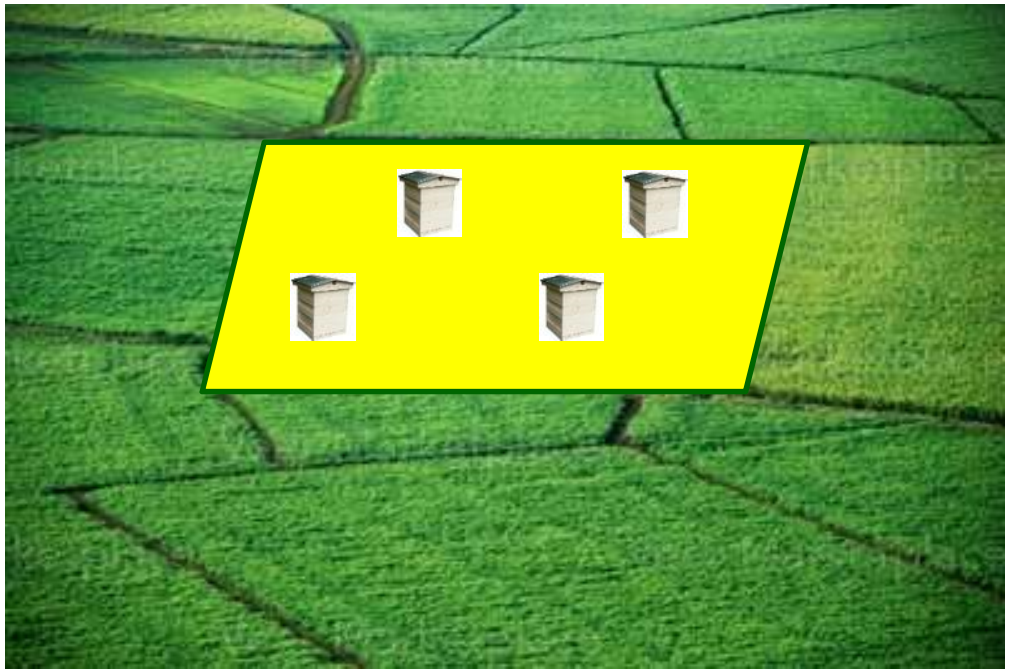
Do we have enough honeybees?

Supply and demand:

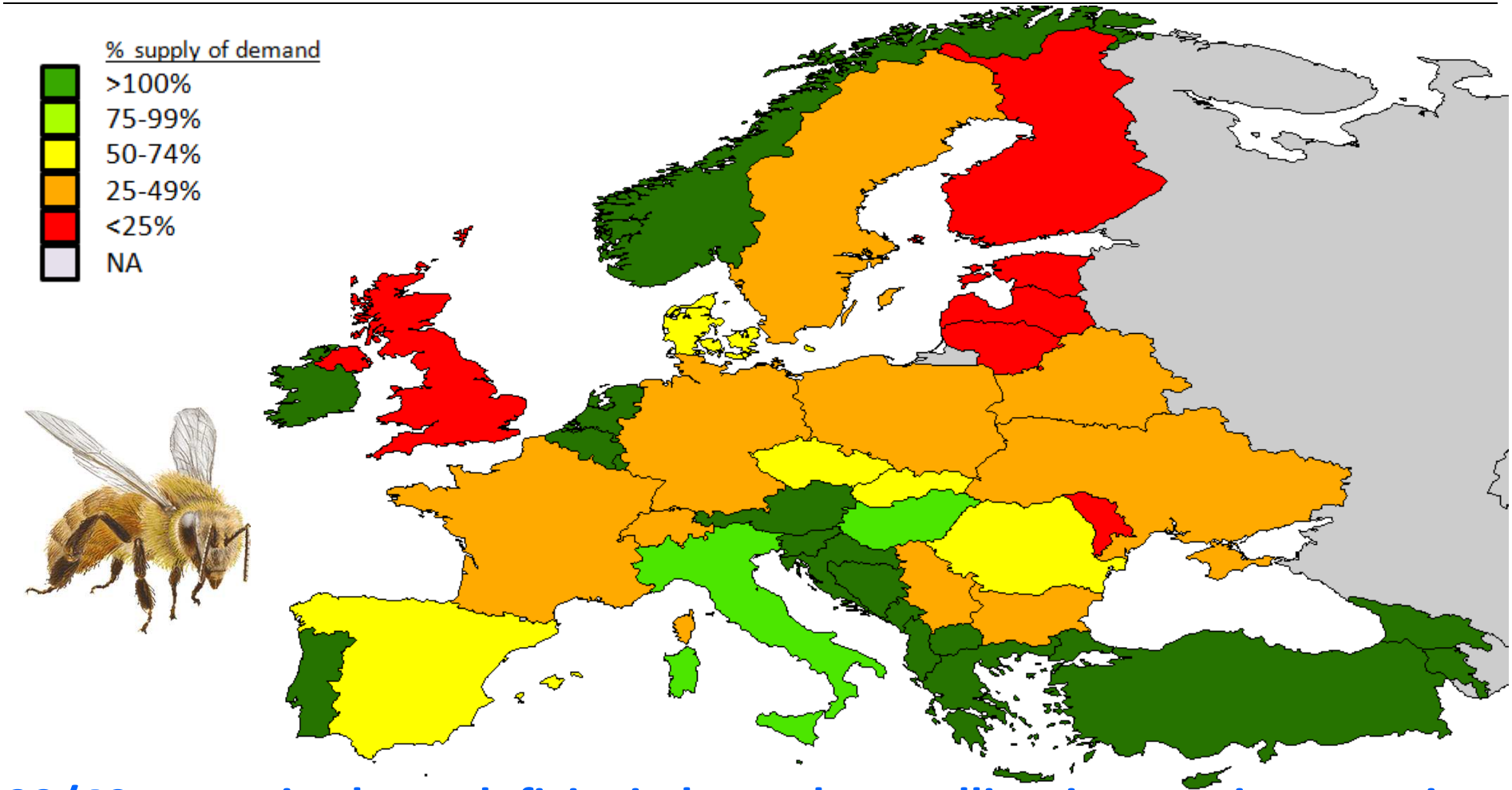
1. **Demand: Area of pollinator dependent crops + recommended hive density**
2. **Supply: Actual hive availability**





Breeze et al. (2014) ***PLoS ONE***

Supply vs. demand across Europe



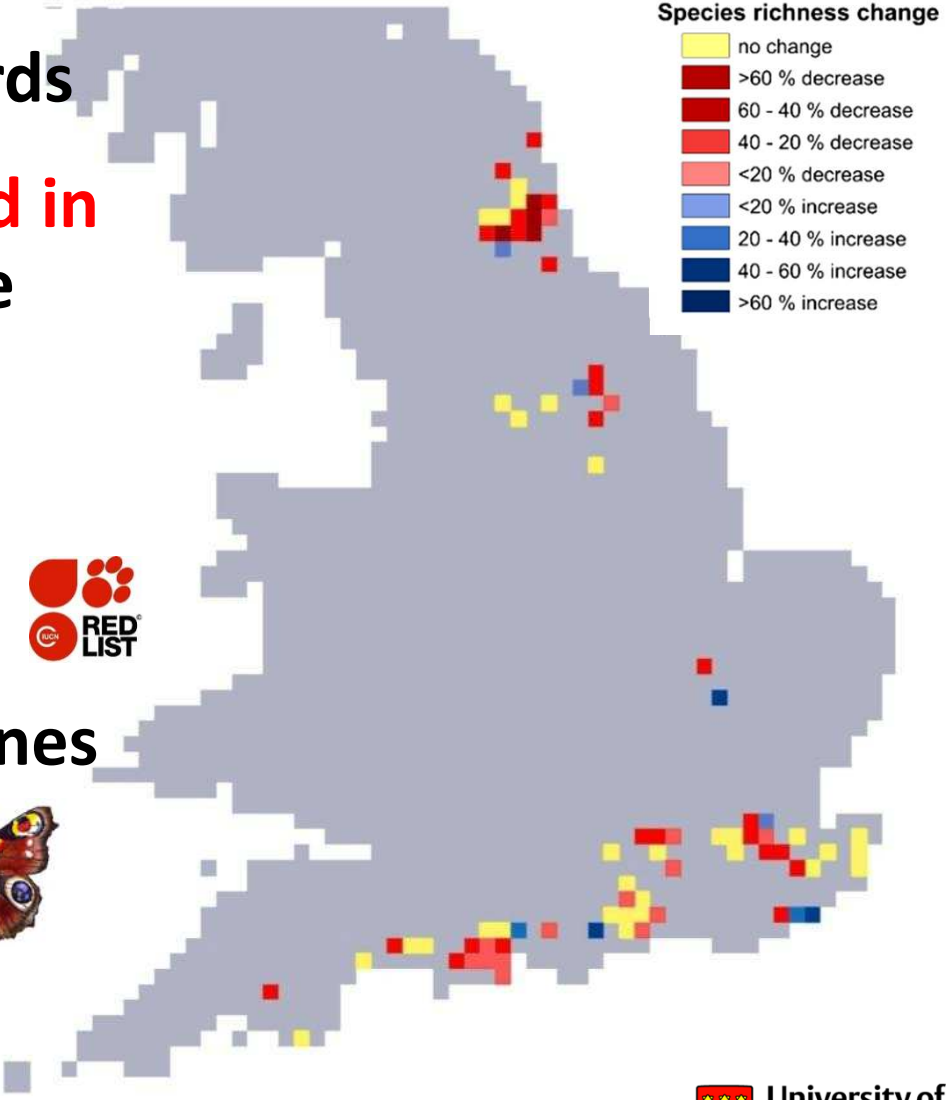
22/40 countries have deficits in honeybee pollination service capacity

UK has <25% of the honeybees it needs for crop pollination

Breeze et al. (2014) ***PLoS ONE***

Status of wild pollinators (2006)

- Used >500k historical records
- Bee diversity has decreased in 52% of UK landscapes since 1980



- UK Red List has 71 species

- Widespread butterfly declines

- Variable patterns for hoverfly shifts

Biesmeijer et al. (2006) ***Science***

2013 Better news?

ECOLOGY LETTERS

Ecology Letters, (2013) **16**: 870–878 doi: 10.1111/ele.12121

LETTER

Species richness declines and biotic homogenisation have slowed down for NW-European pollinators and plants

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Abstract

Concern about biodiversity loss has led to increased public investment in conservation. Whereas there is a widespread perception that such initiatives have been unsuccessful, there are few quantitative tests of this perception. Here, we evaluate whether rates of biodiversity change have altered in recent decades in three European countries (Great Britain, Netherlands and Belgium) for plants and flower visiting insects. We compared four 20-year periods, comparing periods of rapid land-use intensification and natural habitat loss (1930–1990) with a period of increased conservation investment (post-1990). We found that extensive species richness loss and biotic homogenisation occurred before 1990, whereas these negative trends became substantially less accentuated during recent decades, being partially reversed for certain taxa (e.g. bees in Great Britain and Netherlands). These results highlight the potential to maintain or even restore current species assemblages (which despite past extinctions are still of great conservation value), at least in regions where large-scale land-use intensification and natural habitat loss has ceased.

Keywords

Accumulation curves, biodiversity loss, community ecology, plant–flower visitor communities, pollination, similarity, spatial homogenisation, species richness estimations, temporal and spatial patterns.

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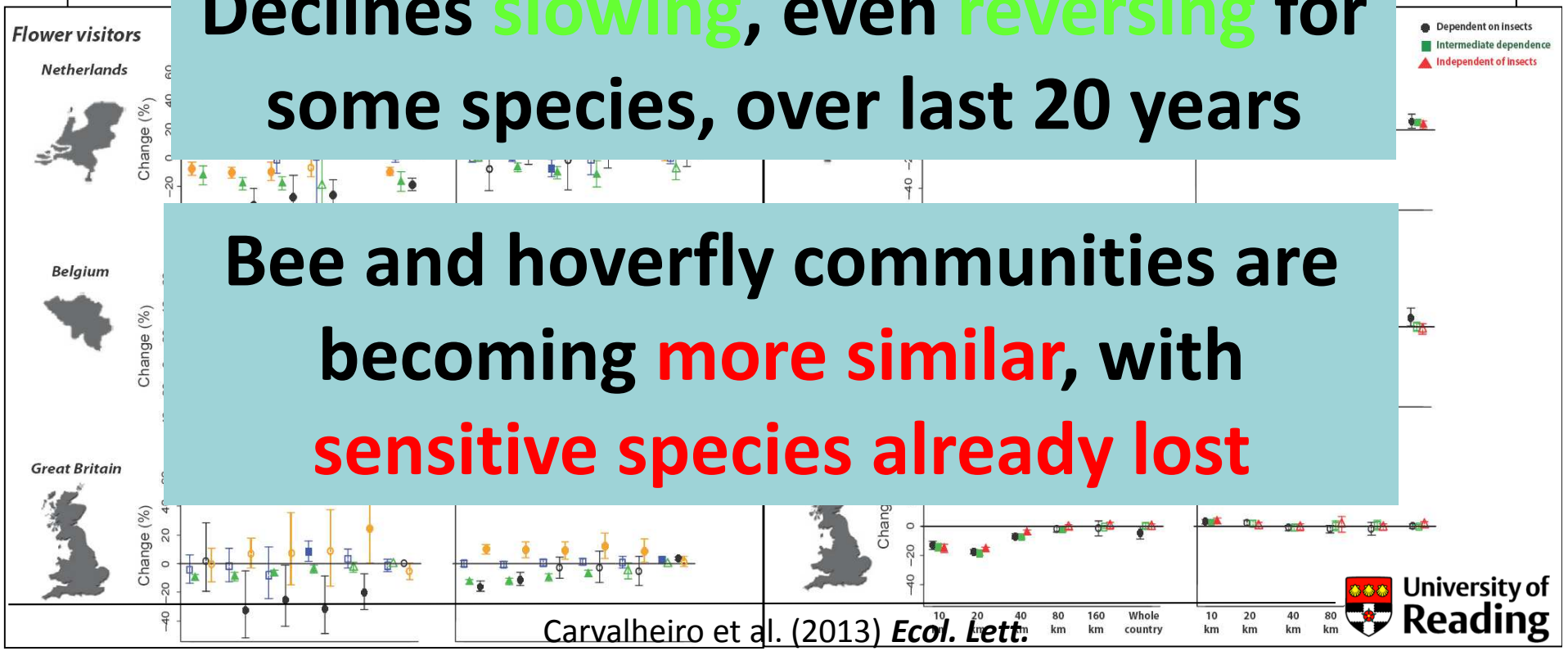
LETTER

Species richness declines and biotic homogenisation have slowed down for NW-European pollinators and plants

Declines slowing, even reversing for some species, over last 20 years

Bee and hoverfly communities are becoming more similar, with sensitive species already lost



Carvalheiro et al. (2013) ***Ecol. Lett.***

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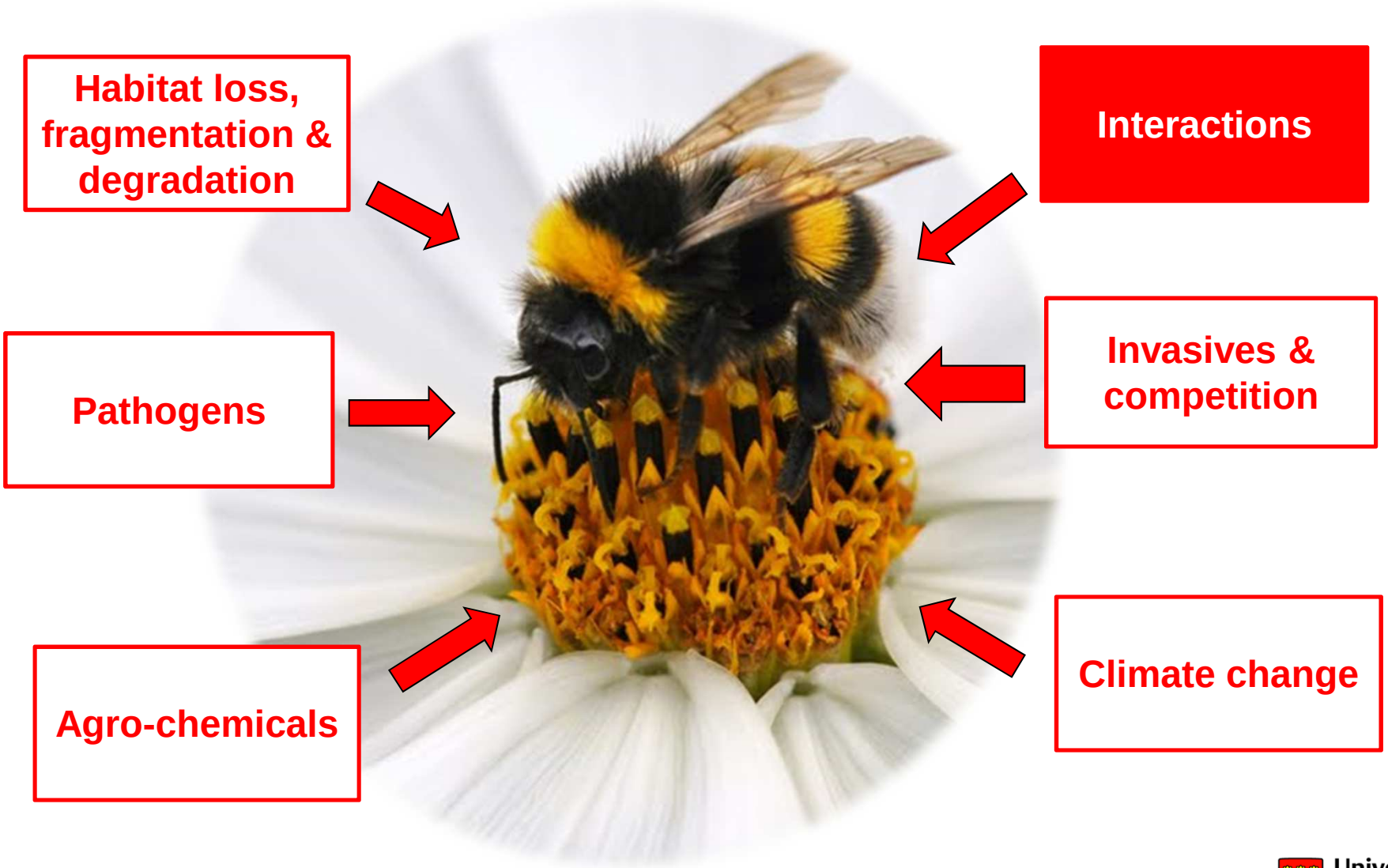
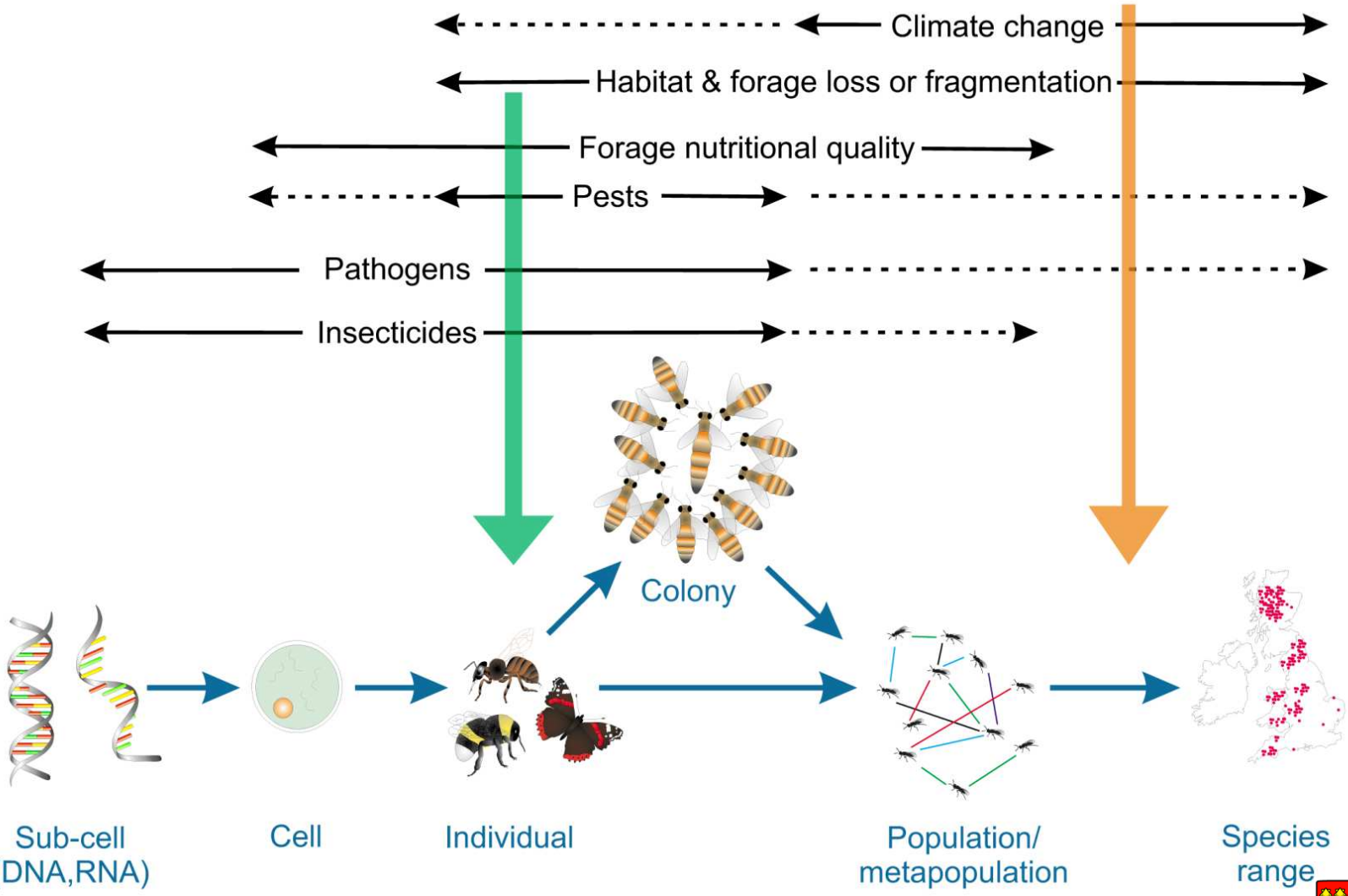
Drivers of change



Potts et al. (2010) ***TREE***

Across time and space



Vanbergen et al. 2013 ***FEE***

Understanding drivers

If we are **mitigating** against loss of pollinators and services, what do we need to know?

- What the causes are
- Species sensitivity
- Which intervention?
  - How much?
  - Where?

Opportunities for Policy & Practice

Evidence can help inform:

- National Pollinator Strategy
- Agri-Environment Schemes (NELMS, CAP)
- Biodiversity 2020
- Growers
- Beekeepers
- Conservation groups
- Landowners
- Businesses

Aims of the meeting

1. Present the key outcomes of the AgriLand project
2. Discuss how evidence from AgriLand, combined with other knowledge, can be used to inform policy and practice
3. Identify steps to achieve this

Thank you

AgriLand (IPI) funders

Your contributions…

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