



Assessing the Risks of Pollinator Loss

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Workshop on Solitary Bees: Conservation, Rearing and Management for Pollination

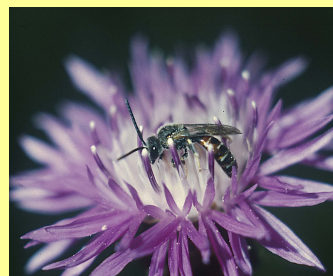
Beberibe, Ceará April 26-30, 2004



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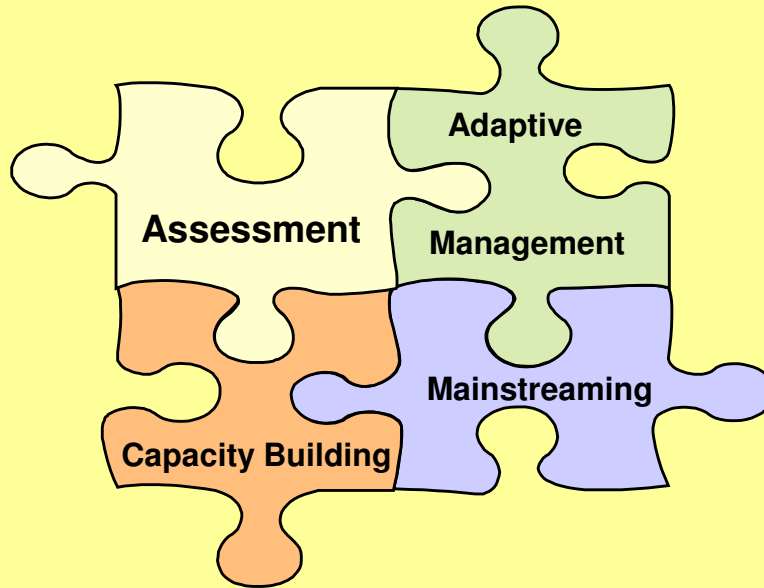


“To integrate pan-European expertise relating to pollination into a cohesive network to overcome the currently fragmented activities of scientists, end-users and stakeholders”



EPI - 2

European Pollinator Initiative



EPI - 3



European Pollinator Initiative



ALARM

**Assessment of Large-scale
Environmental Risks
with tested Methods**

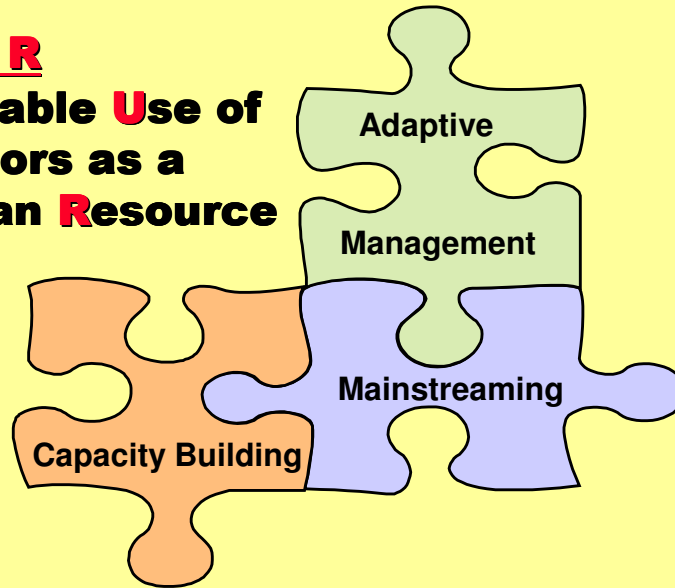
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European Pollinator Initiative



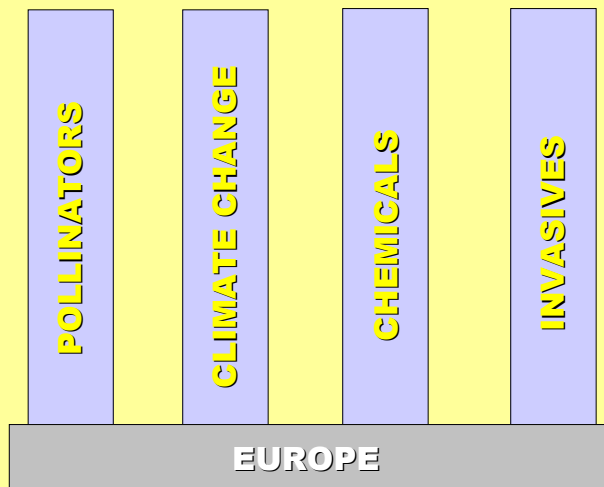
SUPER
Sustainable Use of
Pollinators as a
European Resource



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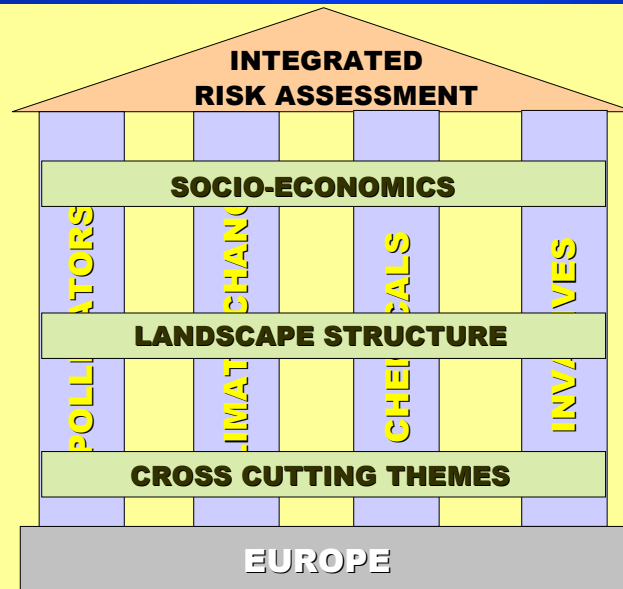
ALARM: Organisation



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ALARM: Organisation



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Pollinator Objectives

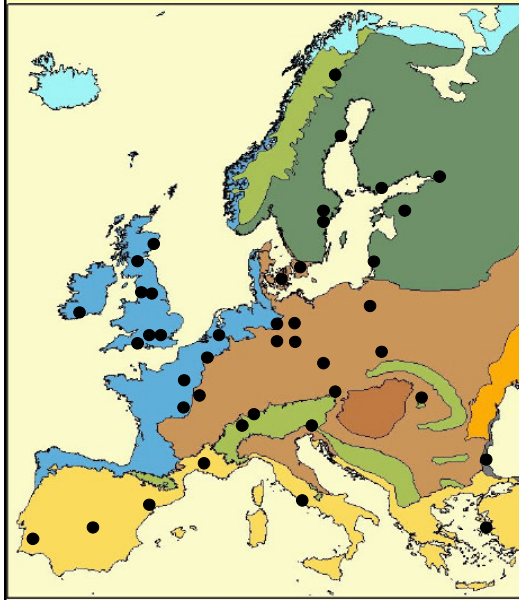


- Quantify distribution shifts in key pollinator groups across Europe
- Measure the **economic** and **biodiversity** risks associated with the loss of pollination services in agricultural and natural habitats
- Determine the relative importance of drivers of pollinator loss
- Develop predictive models for pollinator loss and consequent risks
- Build a knowledge base to underpin the sustainable conservation and management of pollinators throughout Europe

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All Partners in ALARM



Legend

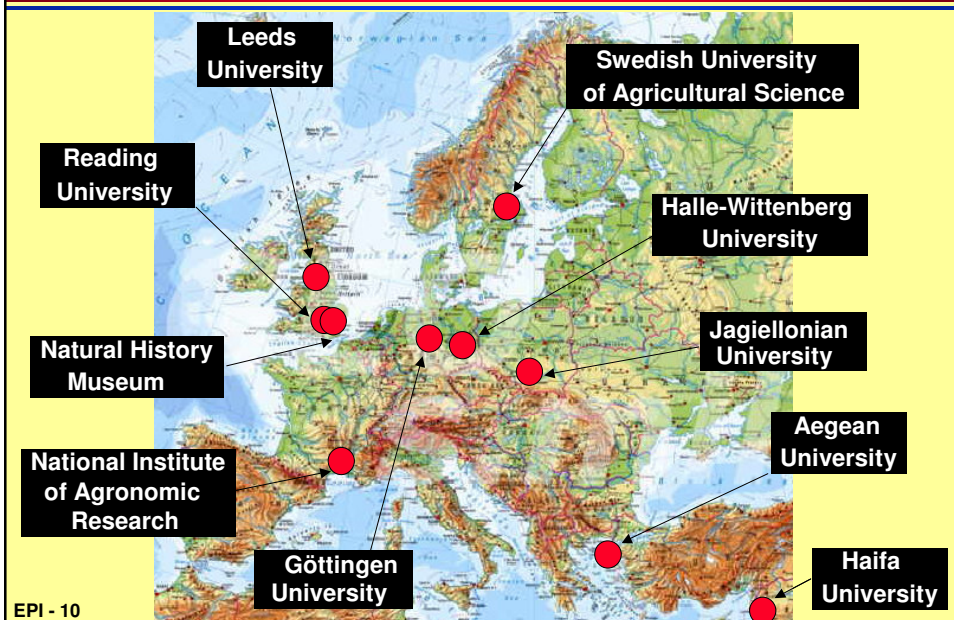
Biogeographic Regions

- Alpine
- Arctic
- Atlantic
- Black Sea
- Boreal
- Continental
- Mediterranean
- Pannonian
- Steppic

54 partners from 26 countries



Pollinator Partners



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ALARM: Work programme



1. Assessing the risk of pollinator declines

- Pollinator data mining
- Repeating historical observations
- Standardised monitoring methods
- Impact of landscape structure and land use

2. Assessing the impacts on pollination services

- Methods to assess pollination limitation
- Impact on pollination of wild plants (biodiversity)
- Impact on pollination of crops (production)

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1. Data and Museum Mining



Centralised European Pollinator Database:

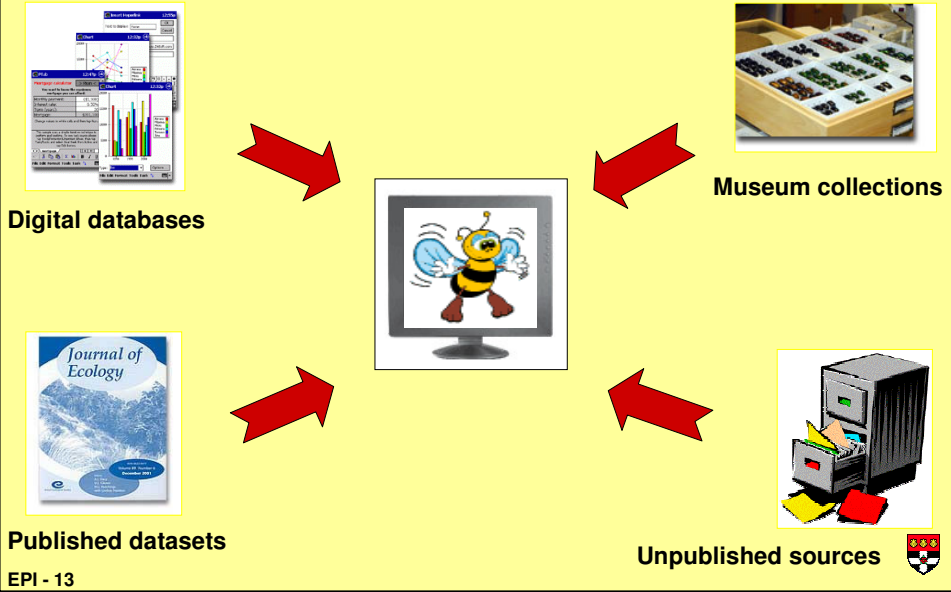


- Distribution
- Habitat requirements
- Floral associations
- Conservation status
- Taxonomic status

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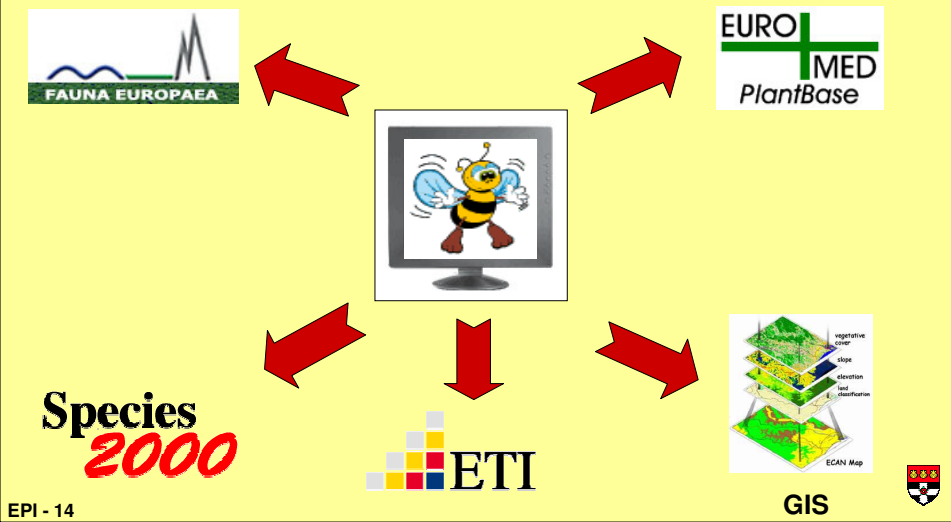
1. Data and Museum Mining



1. Data and Museum Mining



Linked to other key databases



2. Repeated Historical Observations



- Compile list of available historical observations
- Select appropriate subset
- Repeat observations with original protocol and contemporary standardised methods in tandem
- Set of individual point surveys:
 - Range expansions
 - Range contractions (?)



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3. Standardised monitoring methods

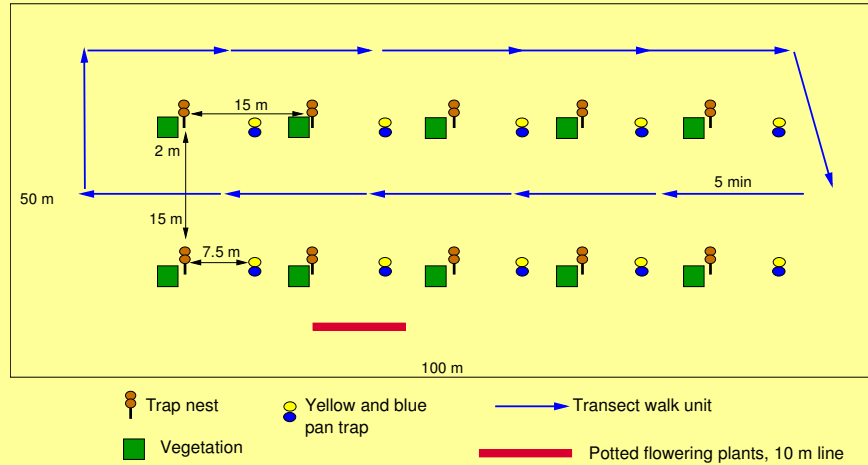


- Quantify pollinator diversity and abundance
- Many potential methods available



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3. Standardised monitoring methods



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3. Standardised monitoring methods



- Quantify pollinator diversity and abundance
- Many potential methods available
- Applicable across a range of habitats and regions
 - Simple vs. Complex habitats
 - Natural vs. Agricultural systems
- Develop European Toolkit



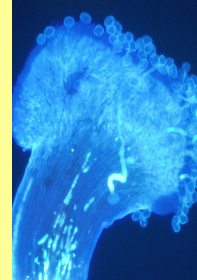
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3. Measuring Pollination Services



- Many potential methods available (>60 in literature)
 - Pollination effectiveness
 - Seed / fruit production
- Quantify effectiveness of pollination services
 - Wild flowers (biodiversity value)
 - Crops (production value)
- Applicable across a range of habitats and regions
- Develop European Toolkit

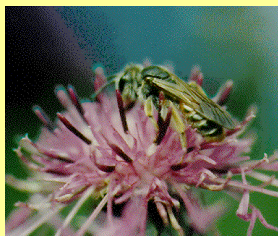


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4. Landscape structure and land use



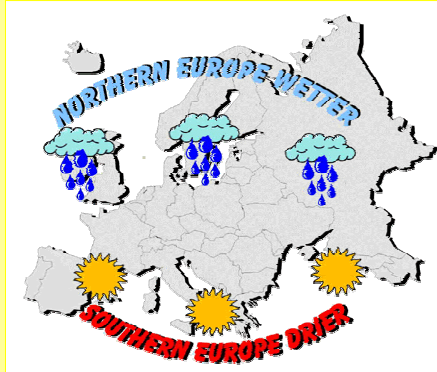
- Impact of landscape structure
 - Fragmentation (real and terrestrial islands)
 - Isolation
 - Patch size
- Organic vs. Conventional
- Extensive vs. Intensive



Sites indicated for conceptual purposes and do not reflect actual selection

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Drivers of pollinator loss



Climate change:

- Shifts in pollinators
- Shifts in host plants
- Changes in phenology



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Drivers of pollinator loss



Environmental Chemicals:

- Direct effects of agrochemicals
- Indirect effects of diffuse pollution



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Drivers of pollinator loss



Invasive species:

- Exotic plants
- Introduced parasites
- Genetic homogenisation



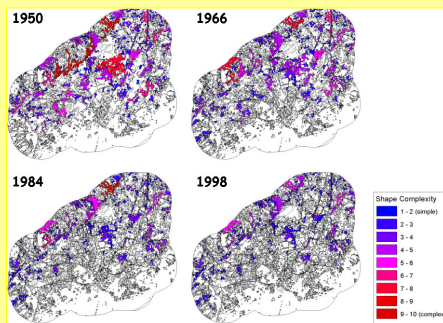
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Drivers of pollinator loss



Landscape structure:

- Land use patterns
- Level of intensification



VS



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Drivers of pollinator loss



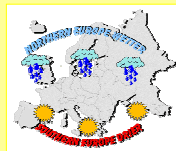
Socio-economic:

- Policy changes
- Technology uptake



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Drivers of pollinator loss



Climate change



Environmental chemicals



Invasives



Socio-economic factors



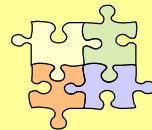
Land use

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ALARM Deliverables



- **Toolkit** for pollinator risk assessment
- Continental assessment of pollinator loss:
 - **Economic risk**
 - **Biodiversity risk**
- Quantify drivers of pollination loss
- Build **predictive models** for pollinator loss and consequent risks
- Knowledge to underpin future development of EPI:
 - **Adaptive Management**
 - **Capacity Building**
 - **Mainstreaming**



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SUPER: Sustainable Use of Pollinators as a European Resource



Objectives of SUPER are to:

- Develop state-of-the-art understanding of the complex ecological, behavioural and evolutionary drivers of plant-pollinator interactions
- Build European taxonomic capacity
- Identify and promote best land-use and conservation practices to restore and protect pollinator communities
- Promote the sustainable management of pollinators in all major agricultural and natural systems
- Maximise the socio-economic benefits from effective pollination services



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Thank you...



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www.rdg.ac.uk/caer/project_epi.html**



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