FUTURE FOR POLLINATORS: The Nature Restoration Law and pollinators

Facts behind the NRL

Denis Michez

Laboratory of Zoology – University of Mons (Belgium)

SAFEGUARD

Facts behind the NRL

- Biodiversity and population trends in Europe?
- Nature restauration law and pollinators
- Data to implement actions -> EU-POMs

SAFEGUARD

Biodiversity of pollinators in Europe

Bees

2138

Syrphid flies

892

Fresh water fishes

524

Butterflies

393

Dragonflies

137

Reptiles

151

Mammals

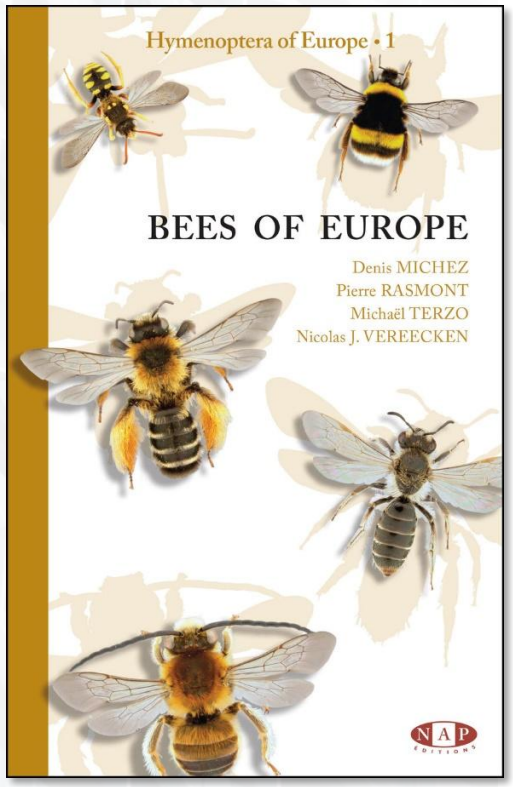
228

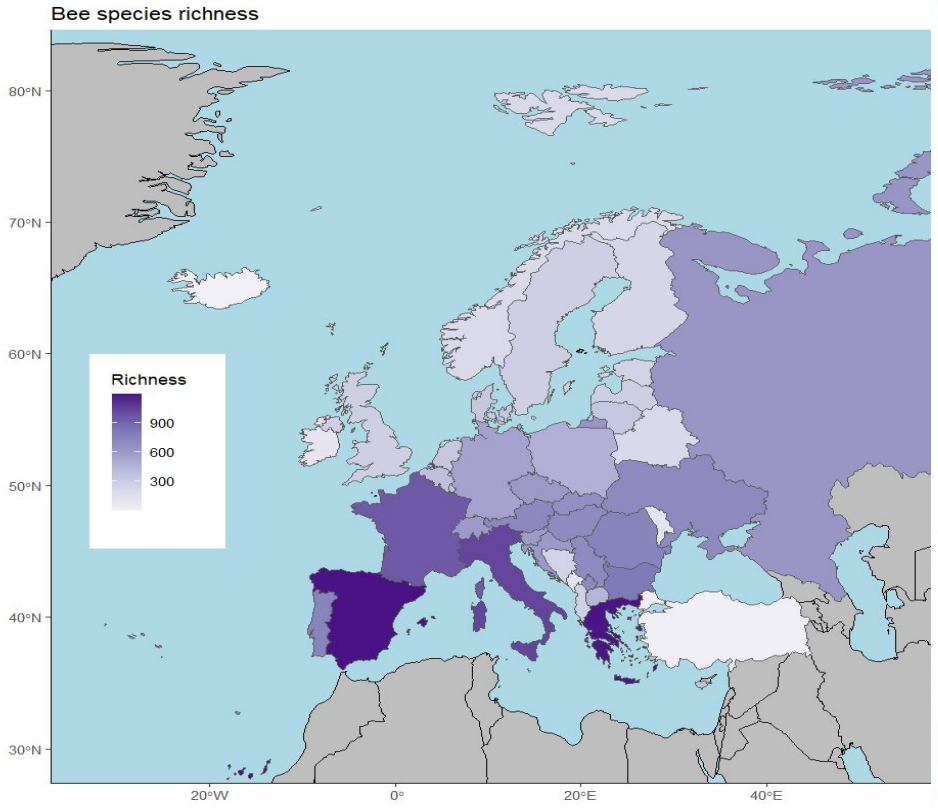
Aquatic Plants

393

SAFEGUARD

Biodiversity of pollinators in Europe





Received: 13 January 2023 | Accepted: 31 July 2023
DOI: 10.1111/icad.12680

ORIGINAL ARTICLE

Insect Conservation and Diversity

National records of 3000 European bee and hoverfly species: A contribution to pollinator conservation

EUROPEAN BEES

2,138 species recorded
(Ghisbain et al. 2023)

North-South gradient of diversity
(Reverté et al. 2023)

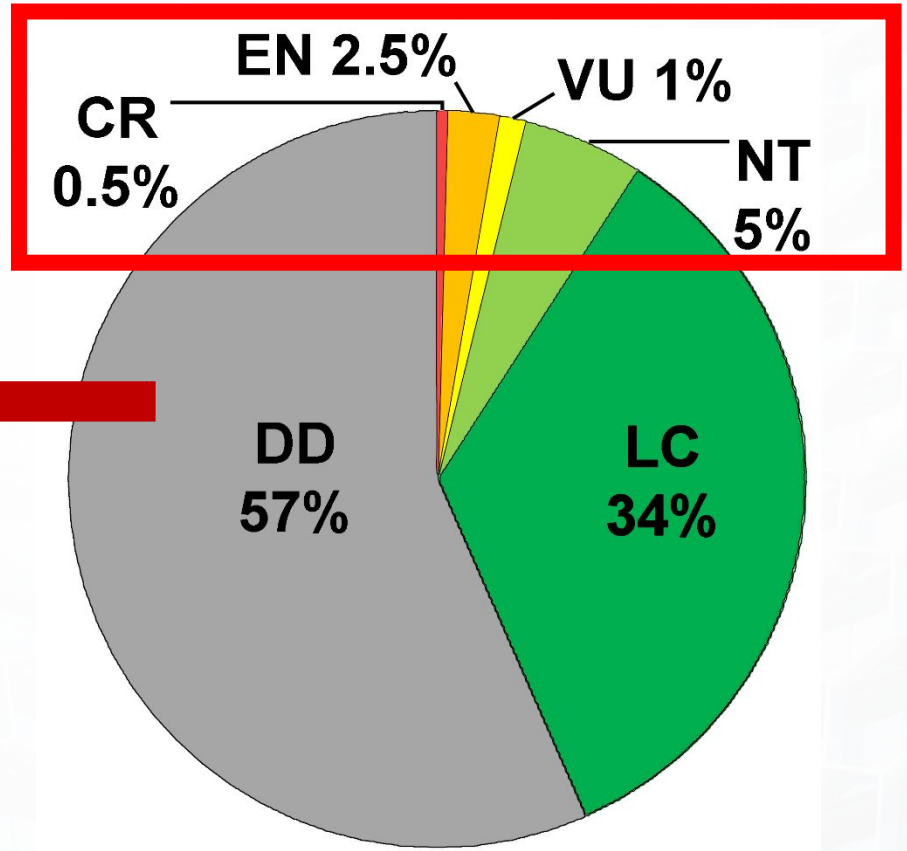
North South gradient of knowledge

20% Endemics

SAFEGUARD

European Red Lists

Assessment of the 1928 species with applicable criteria



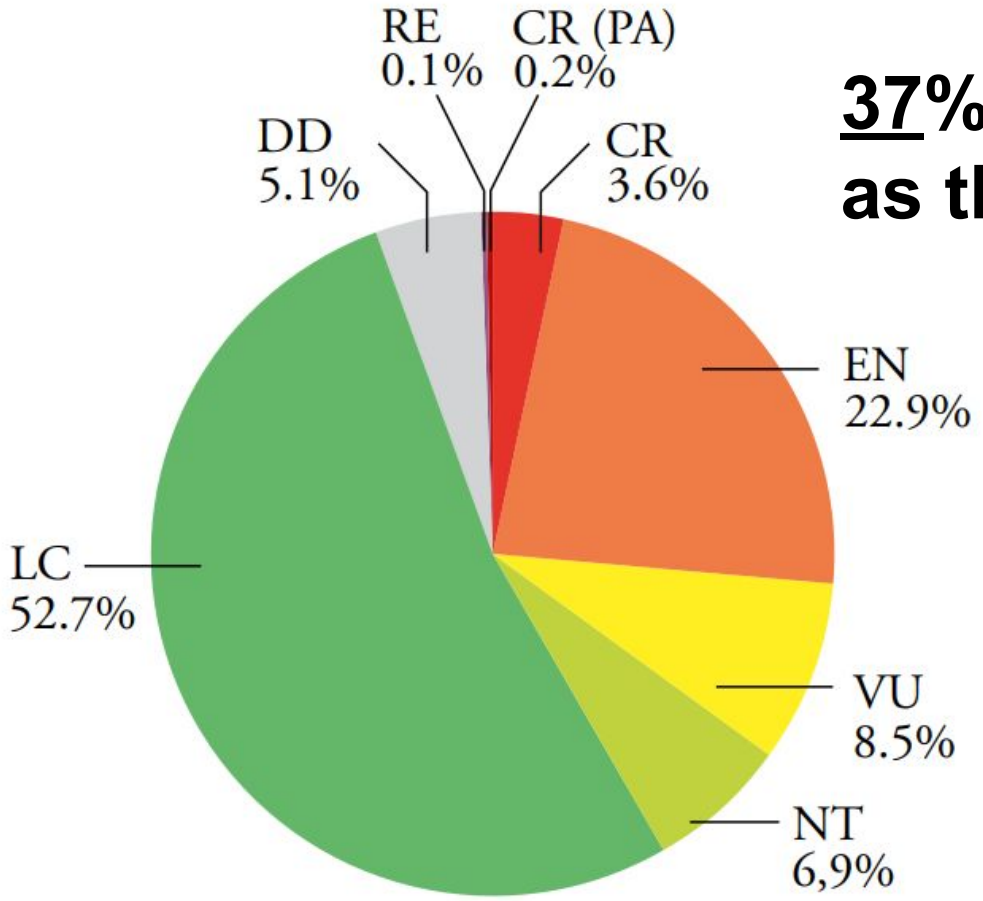
9% assessed as threatened

Many groups with poor data like Megachilidae

Nieto et al. 2014.
Bee ERL

SAFEGUARD

European Red Lists

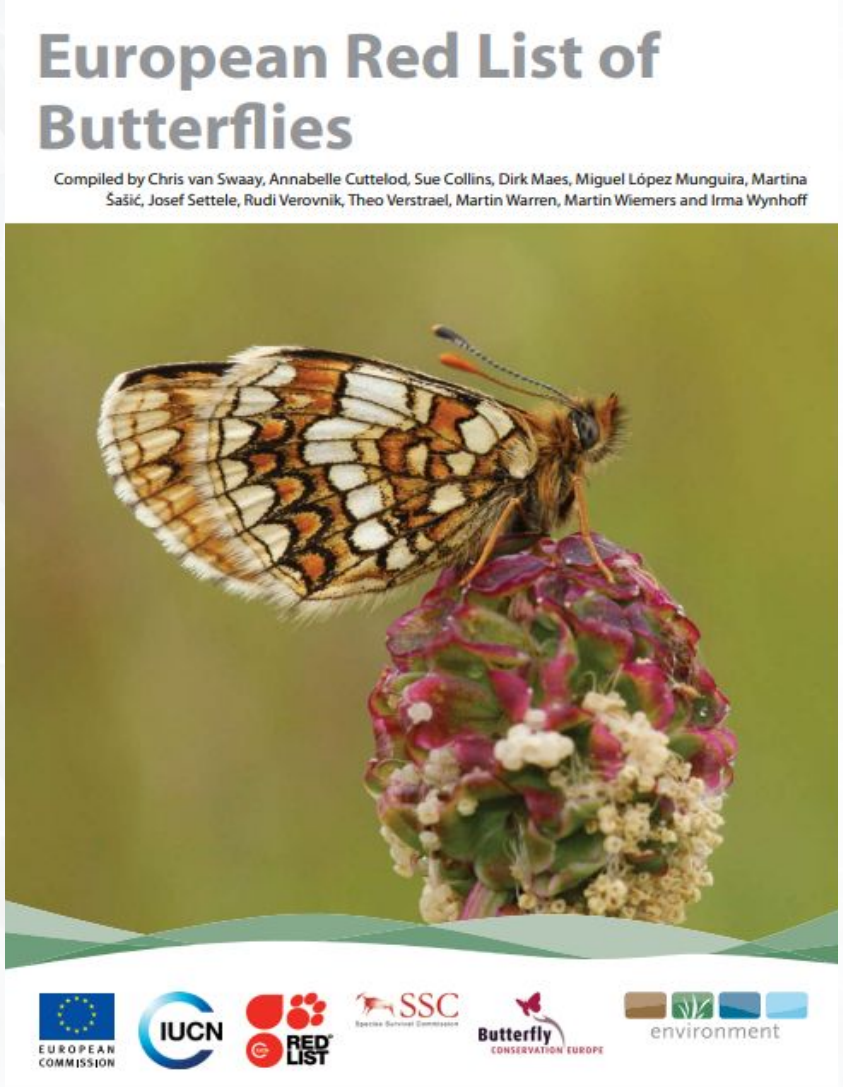


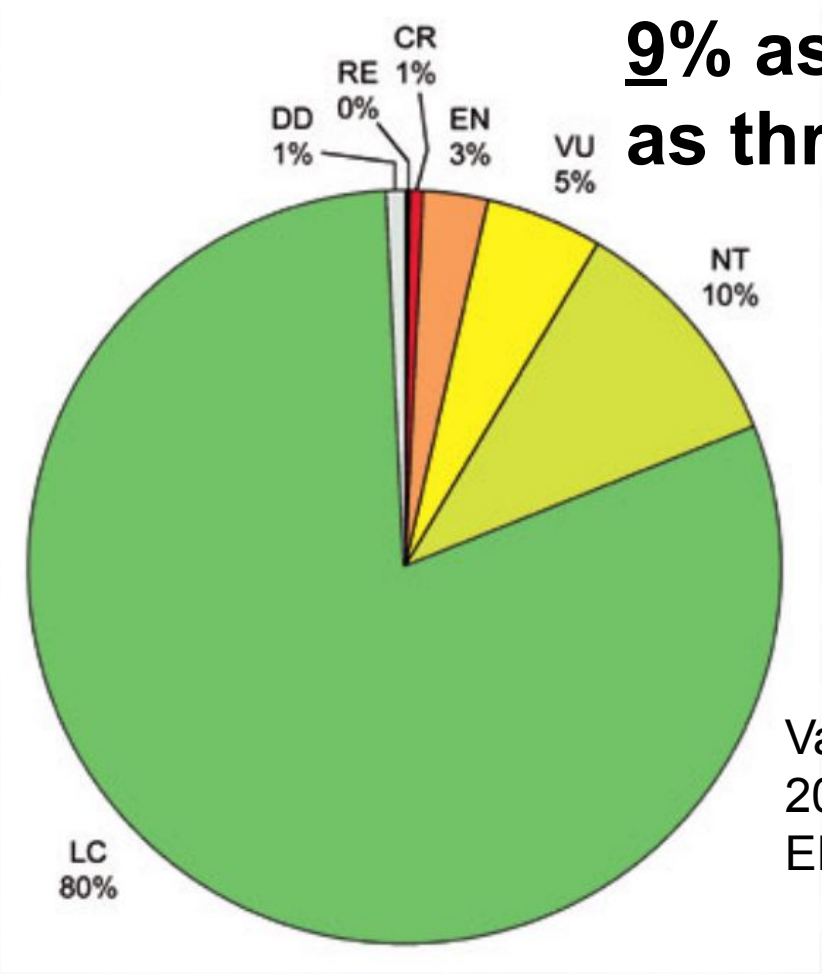
<u>37</u>% assessed as threatened

Vujic et al. 2022. hoverflies ERL

SAFEGUARD

European Red Lists



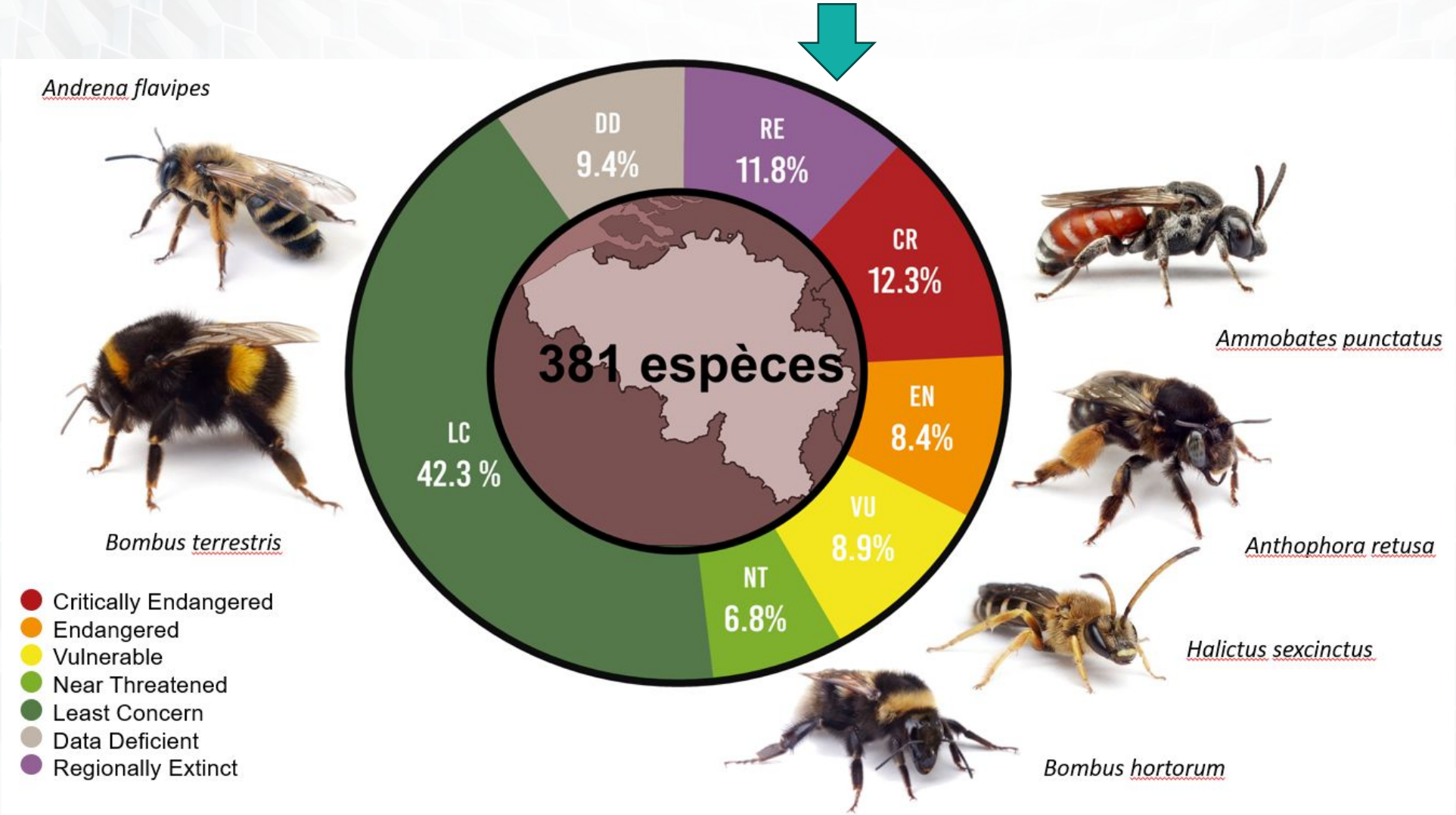


9% assessed as threatened

Van Swaay et al. 2010. Butterflies ERL

SAFEGUARD

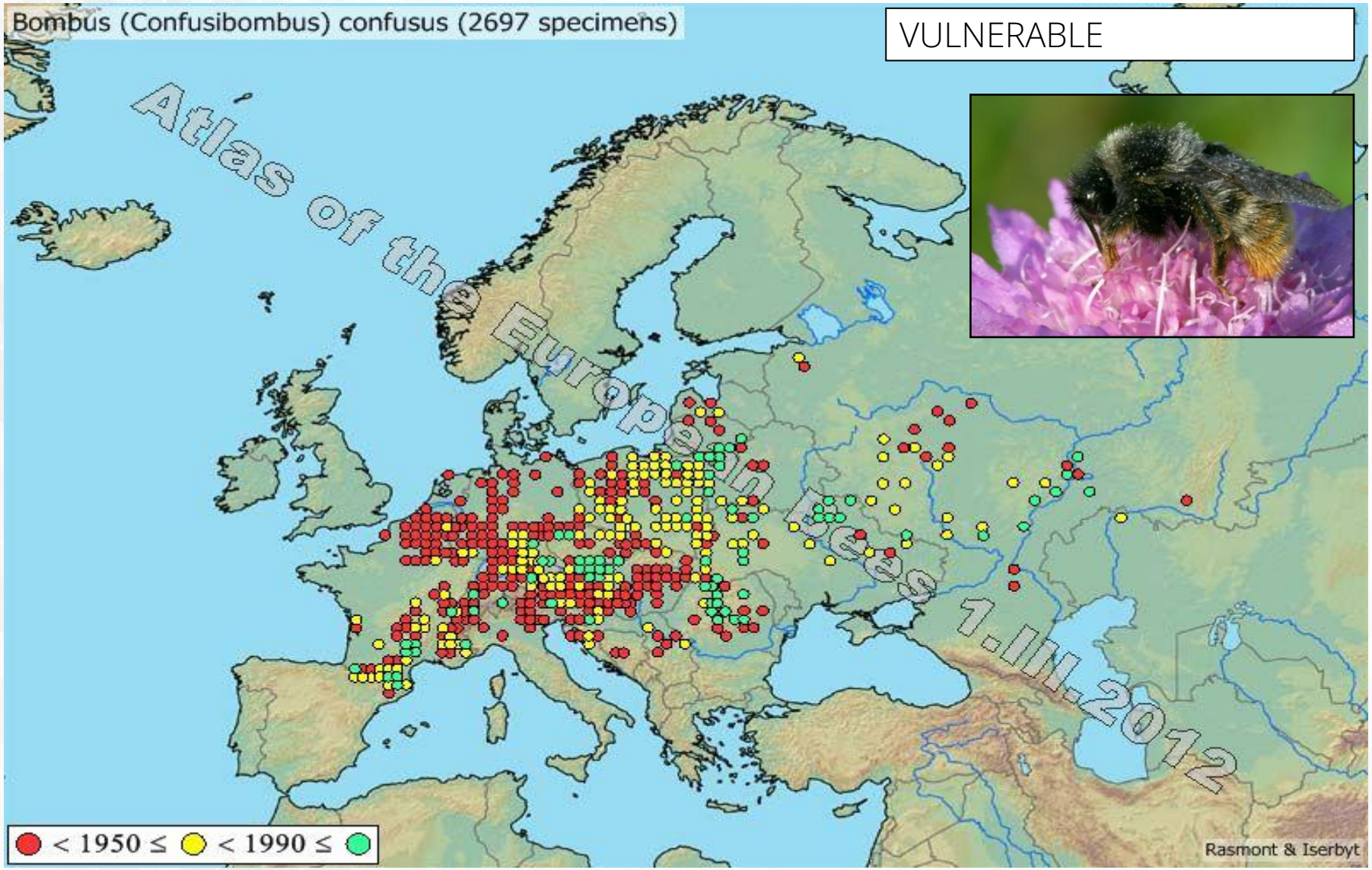
National Red Lists



Drossart et al. 2019. Belgian bees red list.

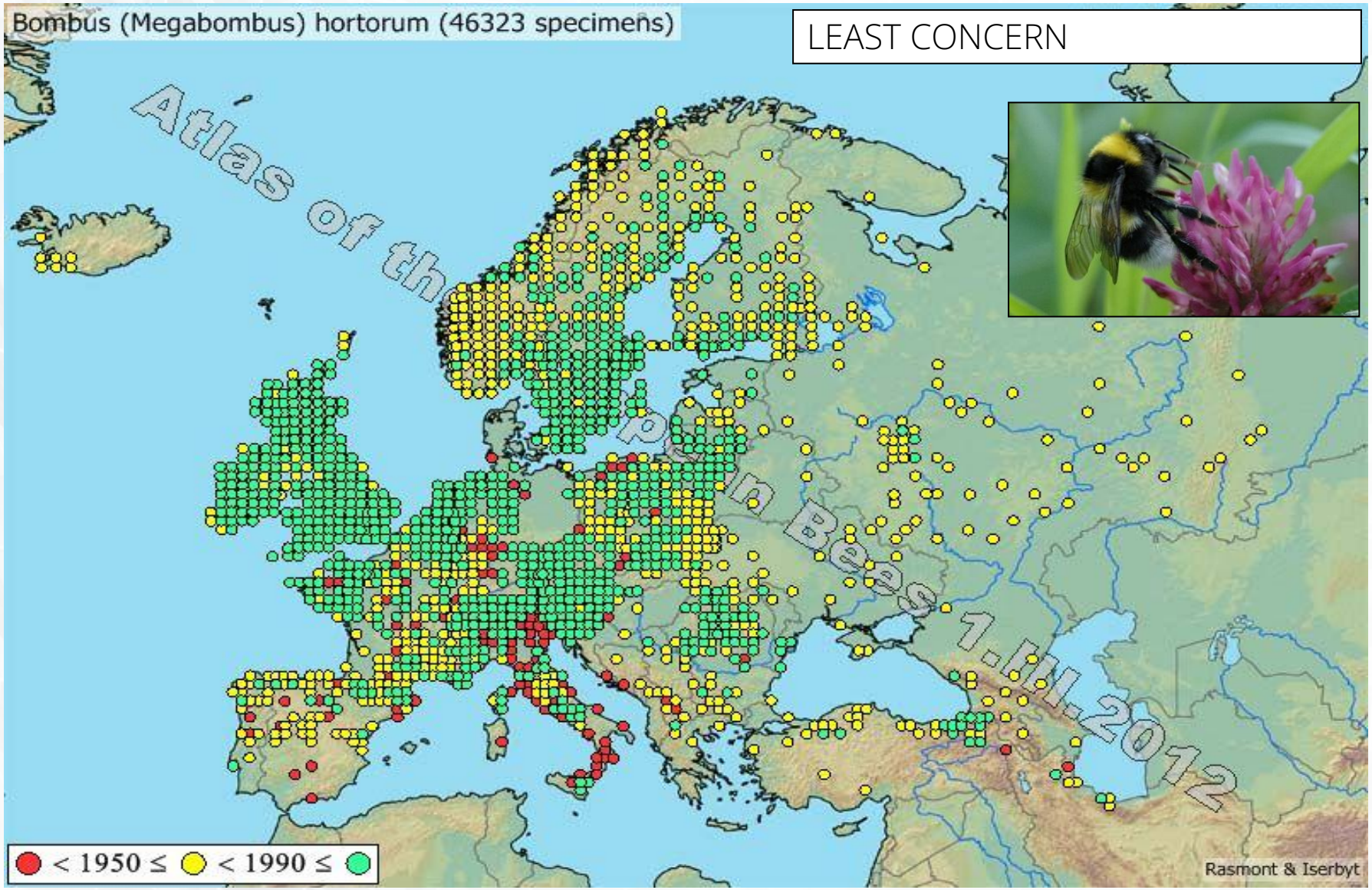
SAFEGUARD

Population trend



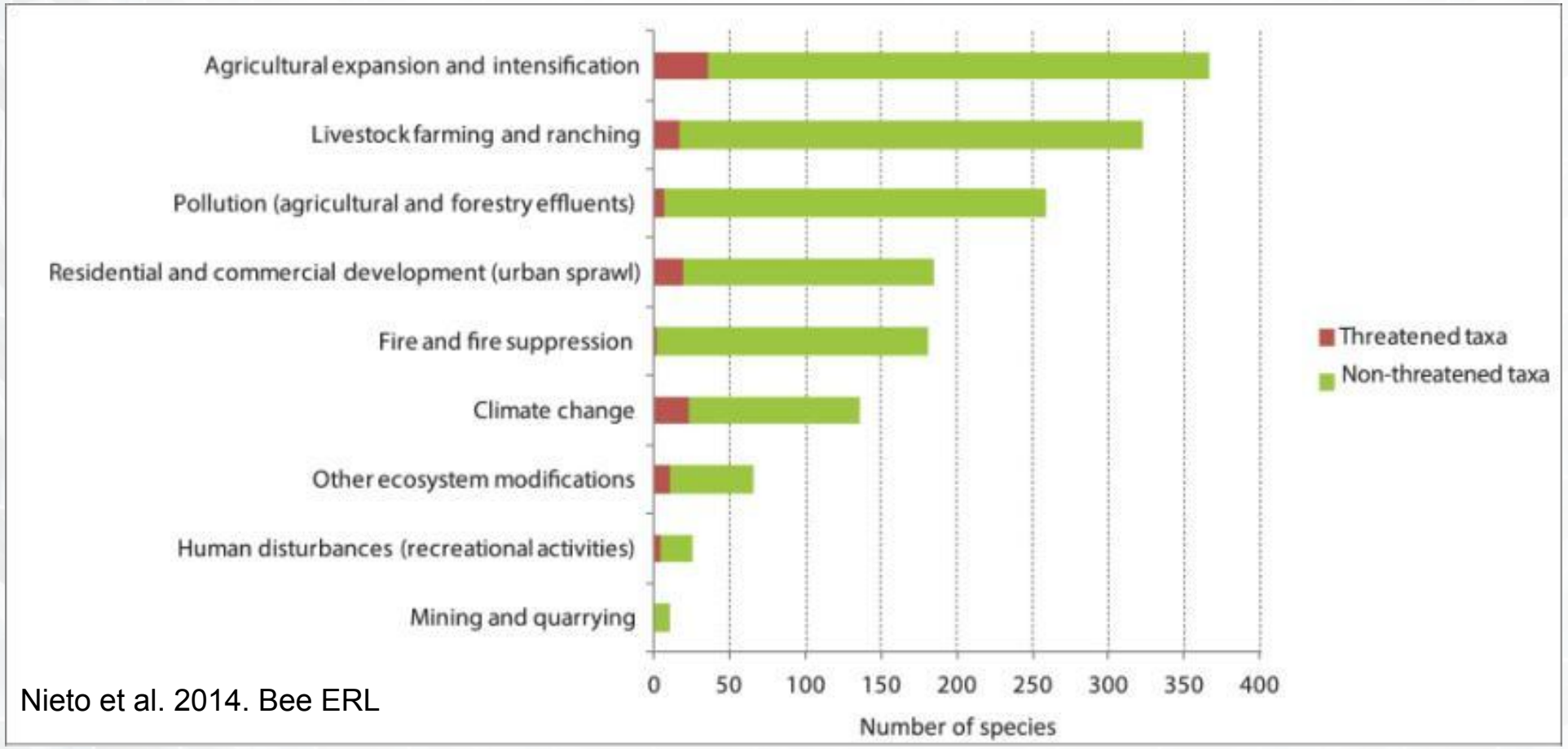
SAFEGUARD

Population trend



SAFEGUARD

Major threats



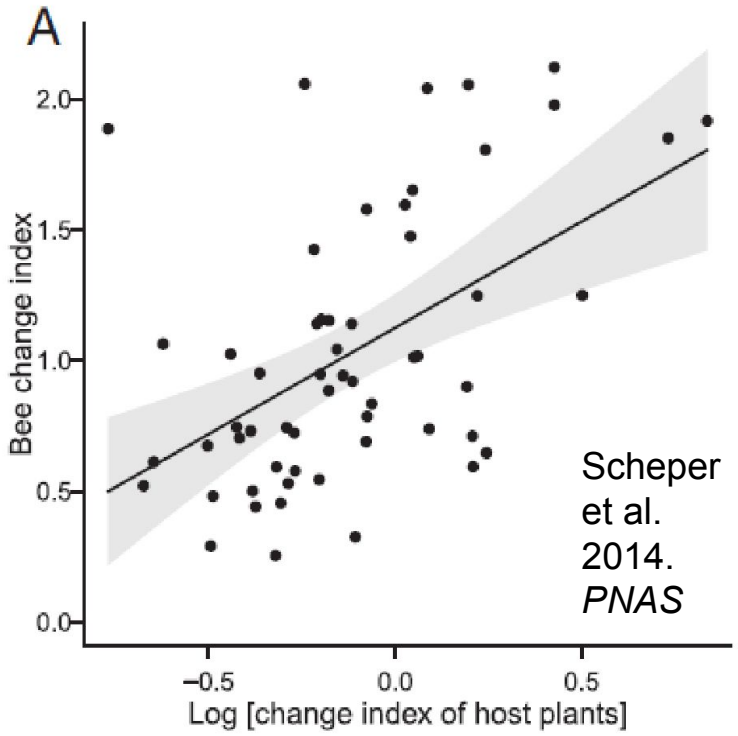
Nieto et al. 2014. Bee ERL

SAFEGUARD

Groups declining : the rare ones

Impact of spatial shift of host-plant? Study in UK and Neth. on all wild bees. Spatial pattern linked to species trait and plant distribution.

- *Specialist or generalist species foraging on declining plants (e.g. Fabaceae, Lamiaceae) are declining faster*



SAFEGUARD

Groups declining : even the common ones

Impact of climate change? Study in Europe on bumblebees.

- *Around 38–76% of European bumblebee species currently classified as 'Least Concern' are projected to loss of at least 30% of territory by 2061–2080*

Article

Projected decline in European bumblebee populations in the twenty-first century

https://doi.org/10.1038/s41586-023-06471-0
Received: 10 February 2023
Accepted: 21 July 2023
Published online: 13 September 2023
Check for updates

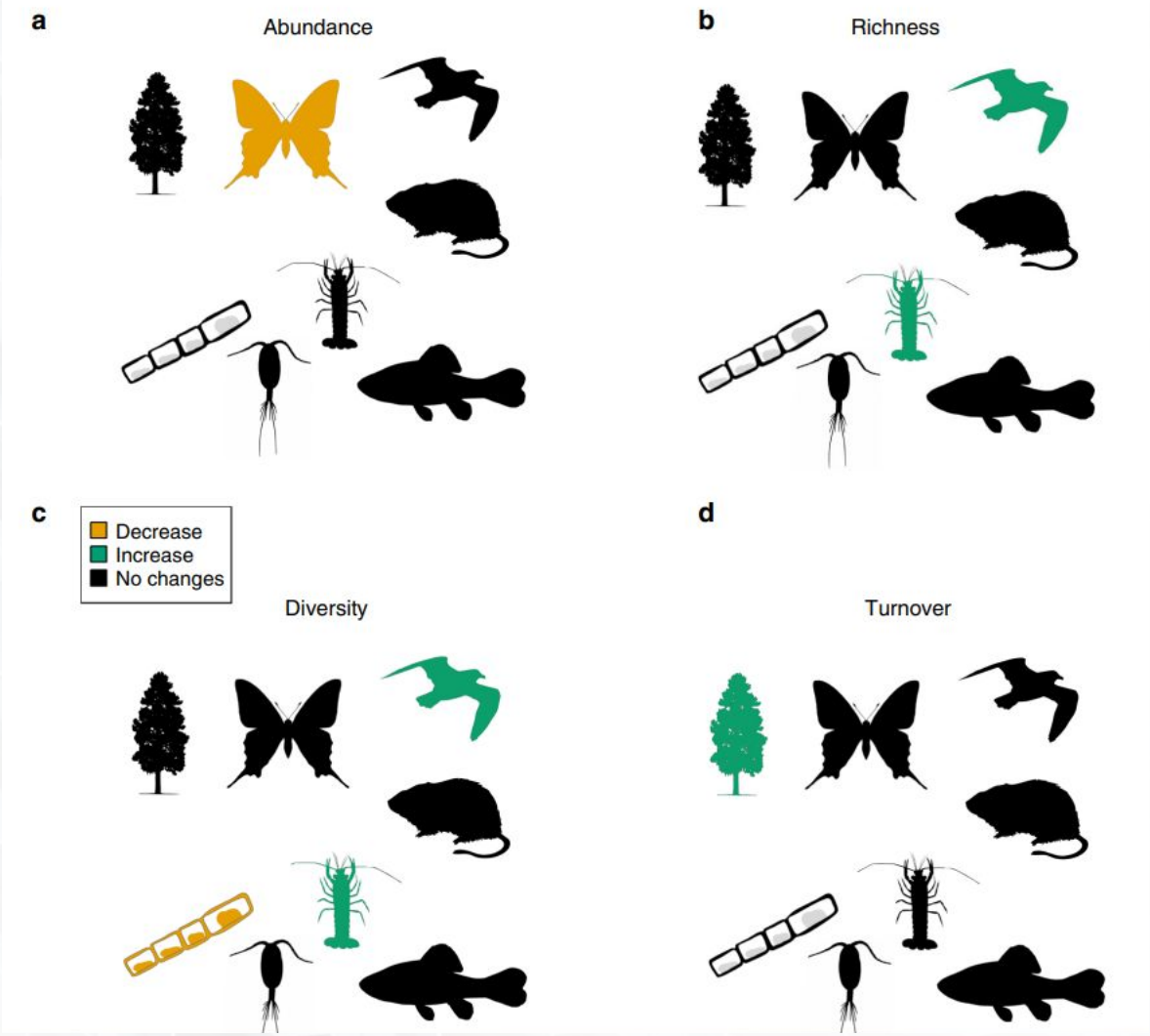
Guillaume Ghisbain[1,2], Wim Thiery[3], François Massonnet[4], Diana Erazo[1], Pierre Rasmont[2], Denis Michez[2] & Simon Dellicour[1,5]

Habitat degradation and climate change are globally acting as pivotal drivers of wildlife collapse, with mounting evidence that this erosion of biodiversity will accelerate in the following decades[1–3]. Here, we quantify the past, present and future ecological suitability of Europe for bumblebees, a threatened group of pollinators ranked among the highest contributors to crop production value in the northern hemisphere[4–8]. We demonstrate coherent declines of bumblebee populations since 1900 over most of Europe and identify future large-scale range contractions and species extirpations under all future climate and land use change scenarios. Around 38–76% of studied European bumblebee species currently classified as 'Least Concern' are projected to undergo losses of at least 30% of ecologically suitable territory by 2061–2080 compared to 2000–2014. All scenarios highlight that parts of Scandinavia will become potential refugia for European bumblebees; it is however uncertain whether these areas will remain clear of additional anthropogenic stressors not accounted for in present models. Our results underline the critical role of global change mitigation policies as effective levers to protect bumblebees from manmade transformation of the biosphere.

Ghisbain et al. 2023. *Nature*

SAFEGUARD

Pollinators decline stronger?



nature COMMUNICATIONS

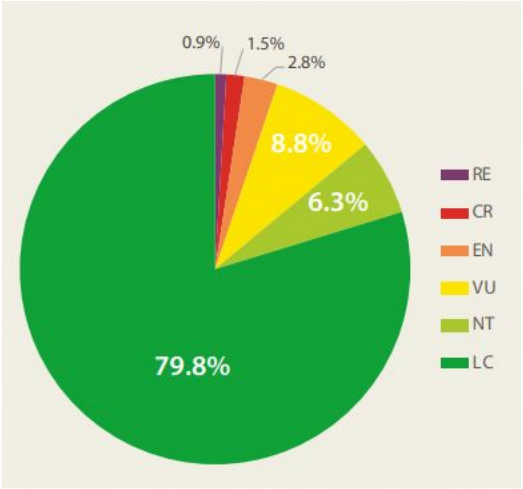
ARTICLE

https://doi.org/10.1038/s41467-020-17171-y OPEN

Check for updates

Meta-analysis of multidecadal biodiversity trends in Europe

Francesca Pilotto et al.#



13% assessed as threatened

BirdLife international 2021. Birds ERL

SAFEGUARD

Facts behind the NRL

- *Biodiversity and population trends in Europe?*

- <u>Nature restauration law and pollinators</u>

"Restoration" is a process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed

SAFEGUARD

Nature restauration law

Vote for legally binding EU nature **restoration** targets to restore biodiversity and degraded ecosystems

GOAL: restore at least **20%** of the EU's land and sea areas by 2030

First ever focused specifically on the recovery of nature in EU member states.

SAFEGUARD

Nature restauration law and pollinators

Pollinators

Wild bees are the best know pollinators. Nonetheless, other insect species also contribute to pollinating flowers, which is **crucial for ensuring that crops can grow**. Almost €5 billion of the EU's annual agricultural output is directly attributed to insect pollinators.

The new rules would **reverse pollinator decline** and increase their populations by 2030.

Pollinators in Europe include butterflies, beetles, bees, hoverflies, moths and wasps.

SAFEGUARD

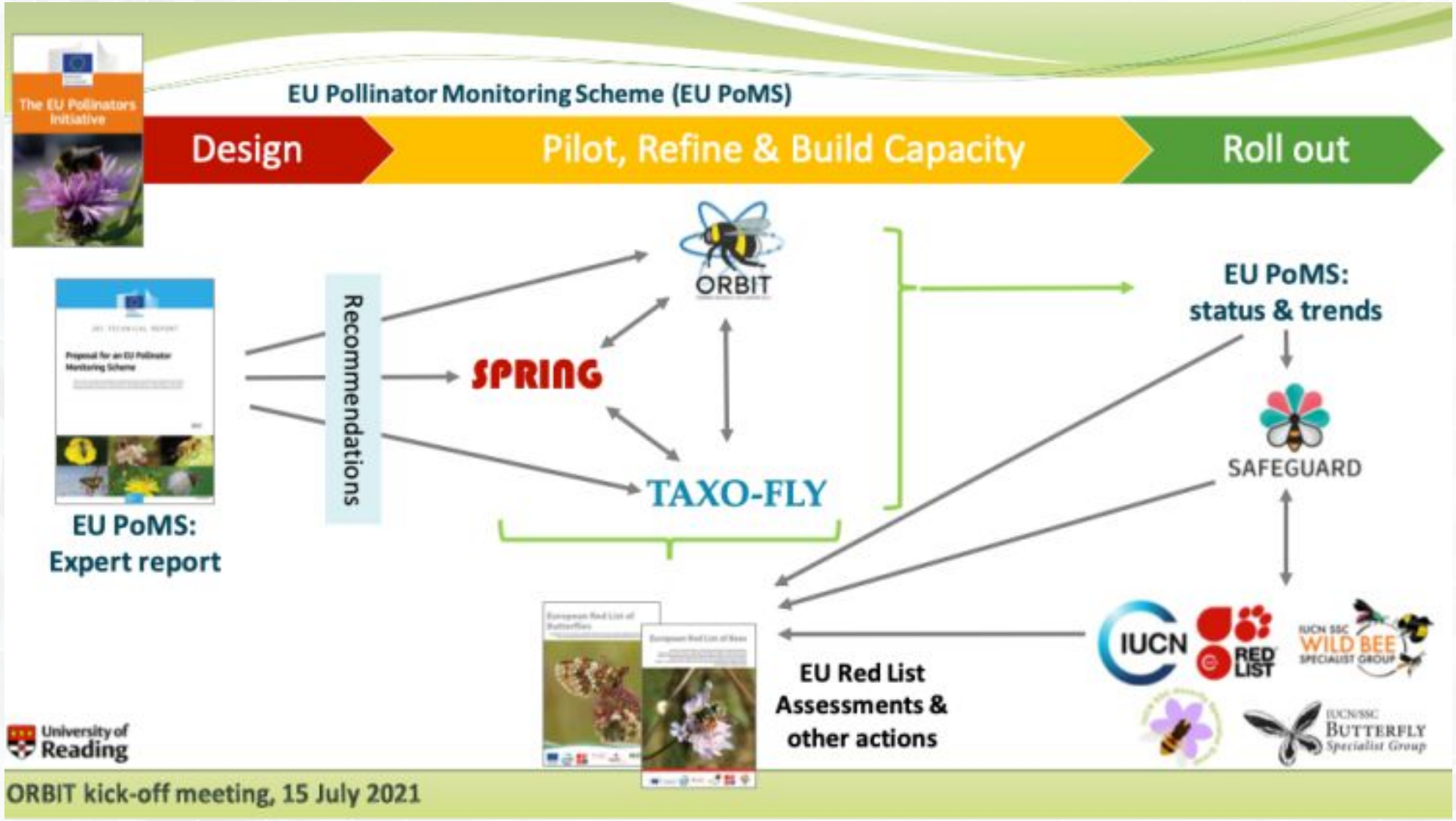
Facts behind the NRL

- *Biodiversity and population trends in Europe?*
- *Nature restauration law and pollinators*

- Data to implement actions -> EU-POMs

SAFEGUARD

EU PoMS -> We need data, we need actions



SAFEGUARD

Selection of teasel bees as red listed species

Dasypoda braccata
Dark Pantaloon Bee

Endangered
B2ab (iii,v)

Dasypoda spinigera
Spiny Pantaloon Bee

Endangered
B2ab (iii)

Dasypoda suripes
Swollen Pantaloon Bee

Endangered
B2ab (iii, iv, v)

Dasypoda argentata
Silvery Pantaloon Bee

Nearly threatened

Selection of teasel bees as red listed species

Andrena hattorfiana
Large Scabious Mining Bee

Least concern

Trachusa interrupta
Scabious Resin Bee

Endangered
B2ab (v)

Threat analysis

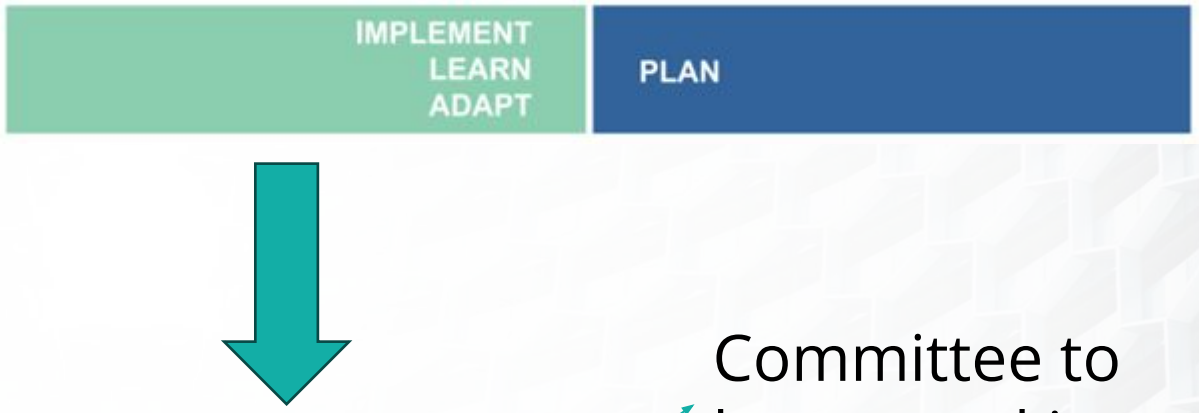
Decline of host-plant

Abandonment (and re-forestation)

Inappropriate mowing
Application of fertilisers/herbicides

+ Over-grazzing?
+ Infrastructure

Preparation of the implementation



- Monitor actions
- Implement actions

Committee to be created in 2023

Actions on policy

Impact on policy -> Policy brief

PoshBee

The impacts of multiple stressors on managed bees:

Novel insights from the PoshBee project

AUTHORS*

Brown M.J.F., Albrecht M., De la Rúa P., Hellström S., Klein A-M., Michez D., Nazzi F., Paxton R.J., Straw E.A., Wintermantel D. & Potts S.G.

POLICY RECOMMENDATIONS

In order to properly understand the risks to managed bees in a real-world context, risk assessments and new research should:

- Implement a systems-based risk assessment approach;
- Develop and apply a post-approval monitoring system to track real impacts of use;
- Consider a greater variety of representative species and sub-species, life history stages, sexes and castes;
- Include field realistic exposure to a wide range of chemical, disease and nutritional stressors, both individually and in combination, and assess a wide range of commonly used and emerging pesticides;
- Routinely adopt more semi-field and field assessments in addition to laboratory studies, including a wide range of forage crops;
- Investigate a broader set of sublethal impacts (measured end-points), ranging from molecular to individual, colony and population effects.

EU and Member State policies aiming to protect and enhance managed bees and wild pollinator health should fully take account of multiple stressors:

- European Food Safety Authority: Risk assessments should use a systems approach, and incorporate post-approval monitoring.
- Common Agricultural Policy Strategic Plans: Specific measures to protect pollinators, and wider biodiversity, should be further developed to mitigate risks from pesticides exposure, such as providing flower-rich habitats.
- Implementation of Pesticides Directive National Action Plans: The risks posed by multiple interacting agrochemicals and the interactions between agrochemicals and other stressors should be recognised and embedded in national plans.
- Biodiversity policies: (Nature Restoration Law, Biodiversity Strategy, EU Pollinators Initiative) should ensure that habitat creation/restoration actions provide a diversity of high quality floral resources throughout the pollinator flight season.
- National Beekeeping Policies: Support should be provided for training beekeepers in improved husbandry to identify and deal with threats from pathogens interacting with pesticide and/or nutritional stress, and also enhanced monitoring for a range of established and emerging pests and diseases.

* Multiple additional authors contributed to the underpinning science and details can be found in the relevant Deliverables.

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 773921.

PoshBee

Mitigating multiple stressors on managed pollinators

Effectiveness and feasibility of implementing response options

AUTHORS

Willcox B.K., Senapathi D., Brown M.J.F., & Potts S.G.

KEY MESSAGES

In the real world, pollinators face multiple interacting pressures, and so response options must be tailored to this. To date, most attention has been on characterising the risks to managed pollinators from single stressors, though recently more attention has been paid to risks from multiple stressors (e.g., pesticides, pathogens and poor nutrition). Until now the focus has been on response to individual stressors, but we are increasingly aware that options that mitigate against multiple stressors are needed.

There are many effective response options to multiple threats. A wide range of response options are available for farmers, beekeepers and policy makers and they vary substantially in their effectiveness for mitigating threats from multiple stressors. In general, the most effective response options are:

- **Farm management:** reducing application rates of pesticides, choosing less toxic active ingredients, reducing drift, adopting IPM, and rewarding farmers for good practices.
- **Habitat management:** Creating flower rich patches, restoring semi-natural habitats, reducing the intensity of grassland management and managing road verges to enhance floral diversity.
- **Bee management:** reducing exposure of hives/managed colonies to insecticides through placement and temporary closure, selecting colonies with reduced pathogen loads, using healthy local queens, and following best practices for selecting reproductive stocks.

The feasibility of implementing response options is greatly improved with policy and industry support (see table on following page). The overall feasibility of implementing response options is highly variable, but all are more feasible to implement with support through the provision of agri-environment type schemes (e.g., payments), industry or government sponsored training or equipment or consumables (e.g., seeds). The most feasible response options are:

- **Farm management:** with support, the most feasible responses are rewarding farmers, reducing spray drift and adopting IPM practices. Without support, the most feasible options are reducing spray drift, hive placement to reduce exposure and providing mass flowering crops as forage.
- **Habitat management:** with support, flower patches, restoring habitats, and grassland and road verge management are most feasible to implement. However, all of these are more difficult to adopt without support.
- **Bee management:** options easy to implement with additional support include beekeeper training, colony certification, controlling trade, hive closure, monitoring pollinator health, payments to beekeepers for services and certifying products as 'bee friendly. Without additional support, hive closure and using healthy queens are the most feasible options to adopt.

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 773921.

TAKE HOME MESSAGE

- Strong decline of pollinators, common and rare
- Development of data and assessment
- Selection of a subset of threatened species
- Development of action plans
- Implementation of the action impacting policy

Contact
Denis Michez
Denis.michez@umons.ac.be