

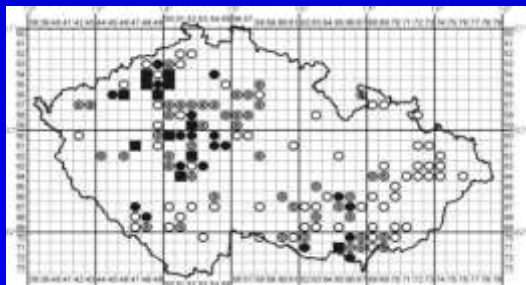
Atlas of Czech Republic Large Moths: Analysing Distribution Changes

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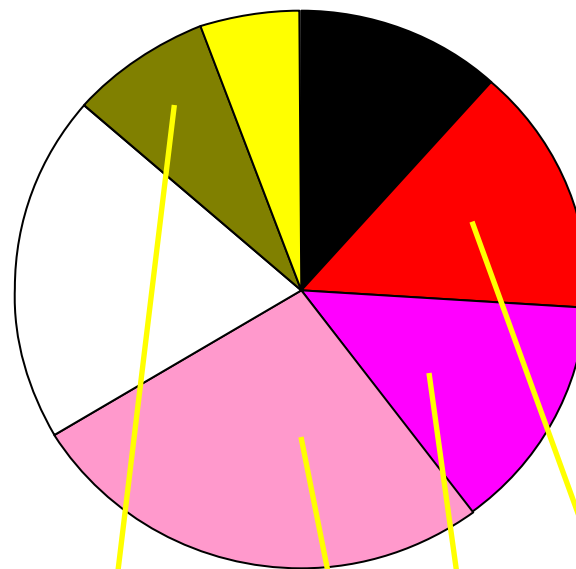
Butterfly distribution changes (2002 book and beyond)



Chasara briseis in 2002 Atlas

Butterfly distribution changes

1951-2001 vs. 2002-2012; 161 species; 430,101 records



- Extinct (19)
- Critically endangered (23)
- Endangered (22)
- Vulnerable (43)
- No change (32)
- Expanding (13)
- Newcomers & migrants (9)

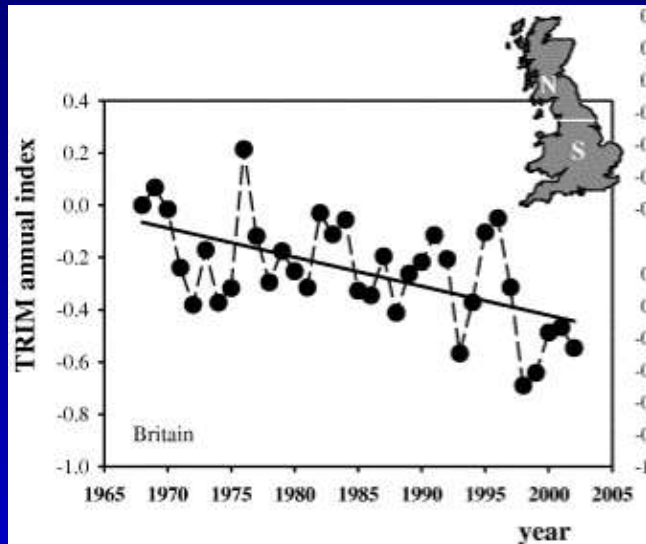
increase >15%
grid cells

loss > 75%, or < 3
cells remaining

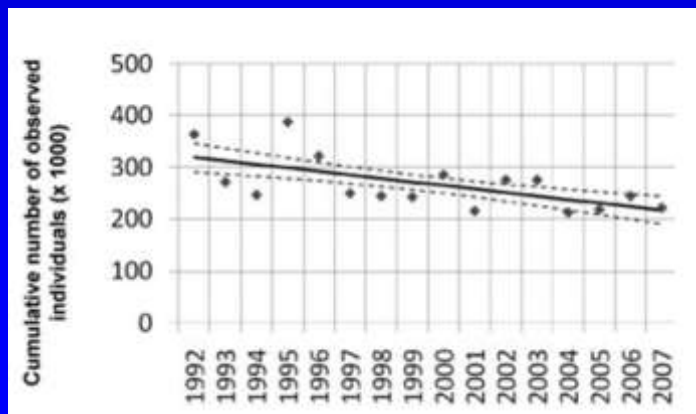
loss 50-75% cells

loss 25-50% cells

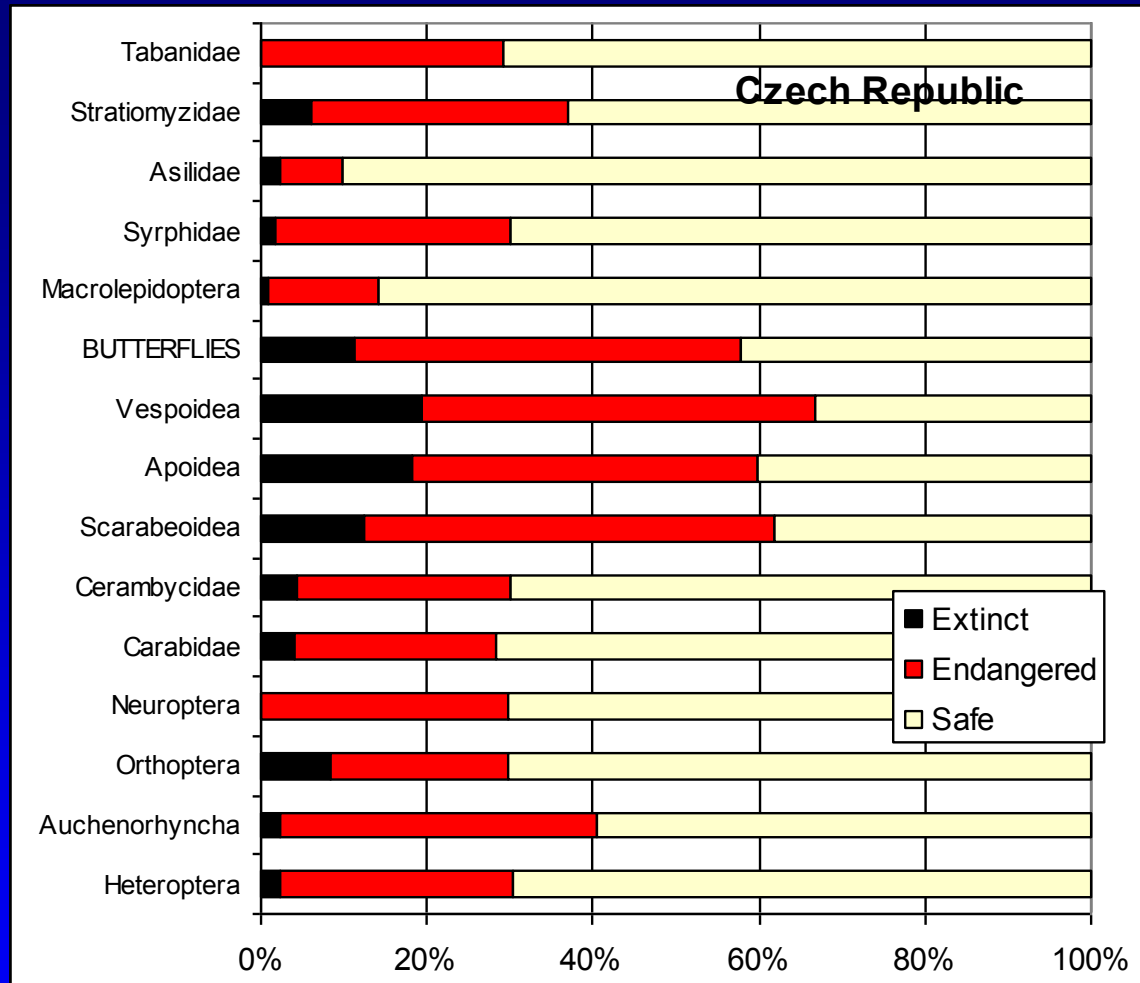
Elsewhere, or in other groups, not better



Common moths, UK
(Conrad *et al. Biol. Conser.* 2006)



Common butterflies, Netherlands
(Van Dyck *et al. Conserv. Biol.* 2009)



Farkač *et al.*, Czech Invertebrates Red List (2005)

Čížek L. *et al. Vesmír* 88: 386-391 (2009)

Why moths and which moths?

Butterflies

161 species (incl. extinct, migrants)

- identification, tradition, collections ...
- pre-atlas 1994 (O. Kudrna) 55 000 records
- first atlas 2002 (Beneš & Konvicka) 150 000 records
- recording goes on (2113?) 440 000 (plus) records

„Macro-Macros“

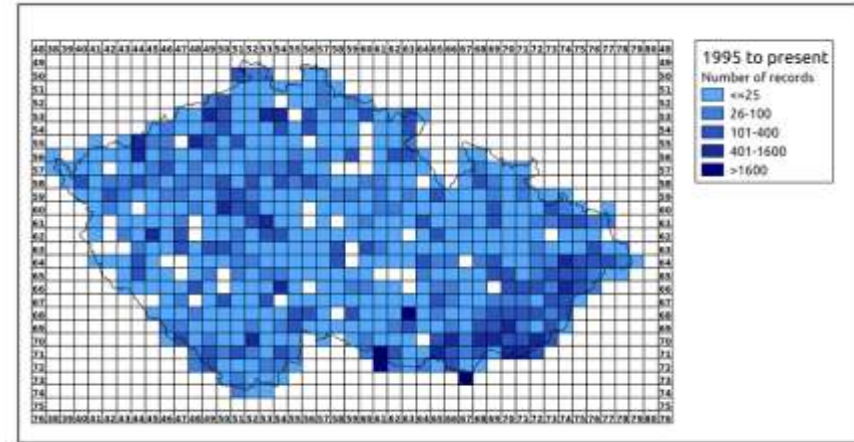
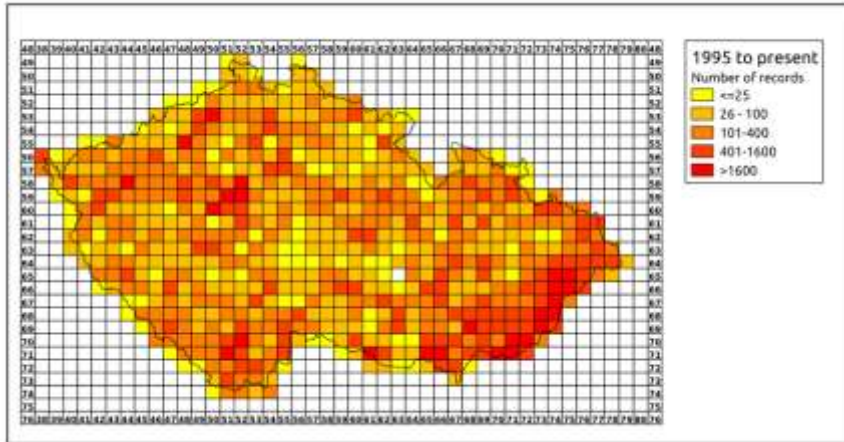
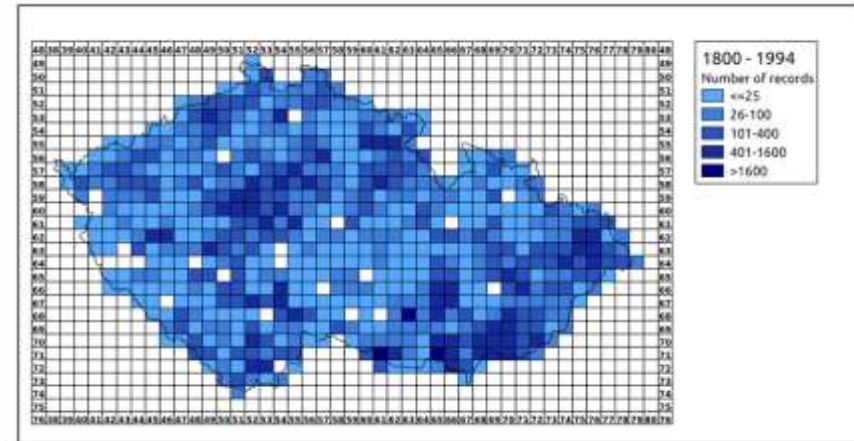
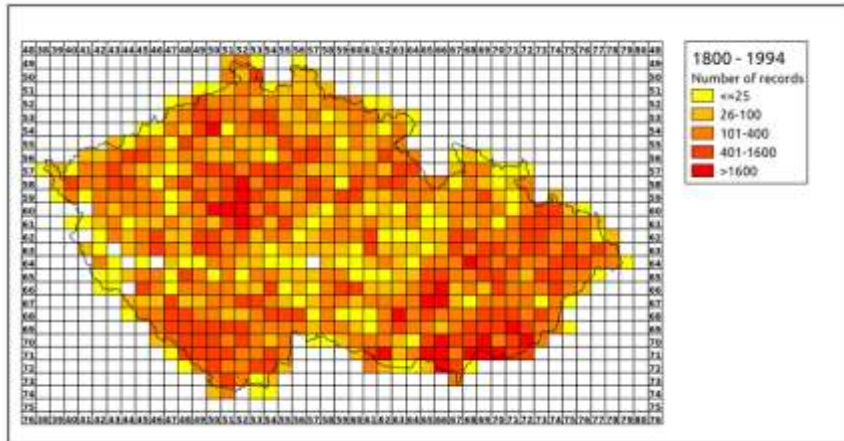
- 176 species
identification, tradition...
- no atlas so far (vs. other countries, e.g., for Denmark)
- recorders asked for it!

Arctiidae, Cossidae, Drepanidae, Endromidae, Hepialidae, Lasiocampidae, Lemoniidae, Limacodidae, Lymantriidae, Notodontidae, Pantheidae, Saturniidae, Sphingidae, Thaumetopoeidae (+Zygaenidae)

FASCINATING comparison.

NOT including the megadiverse *Noctuidae, Geometridae*

Data richness

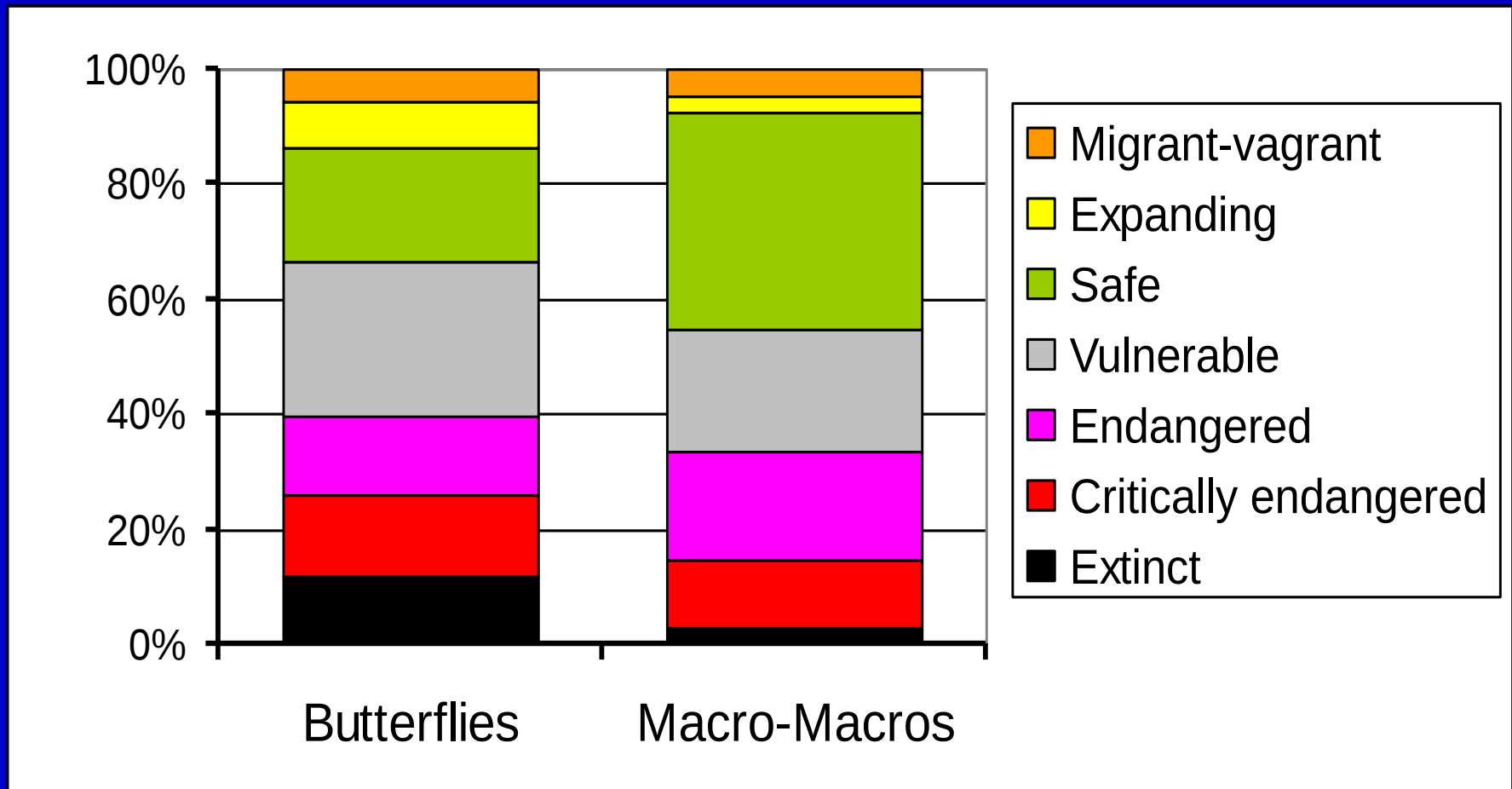


Butterflies

Macro-moths

Moth data sparser => pre-atlas

Distribution trends (pre- vs. post-1995)



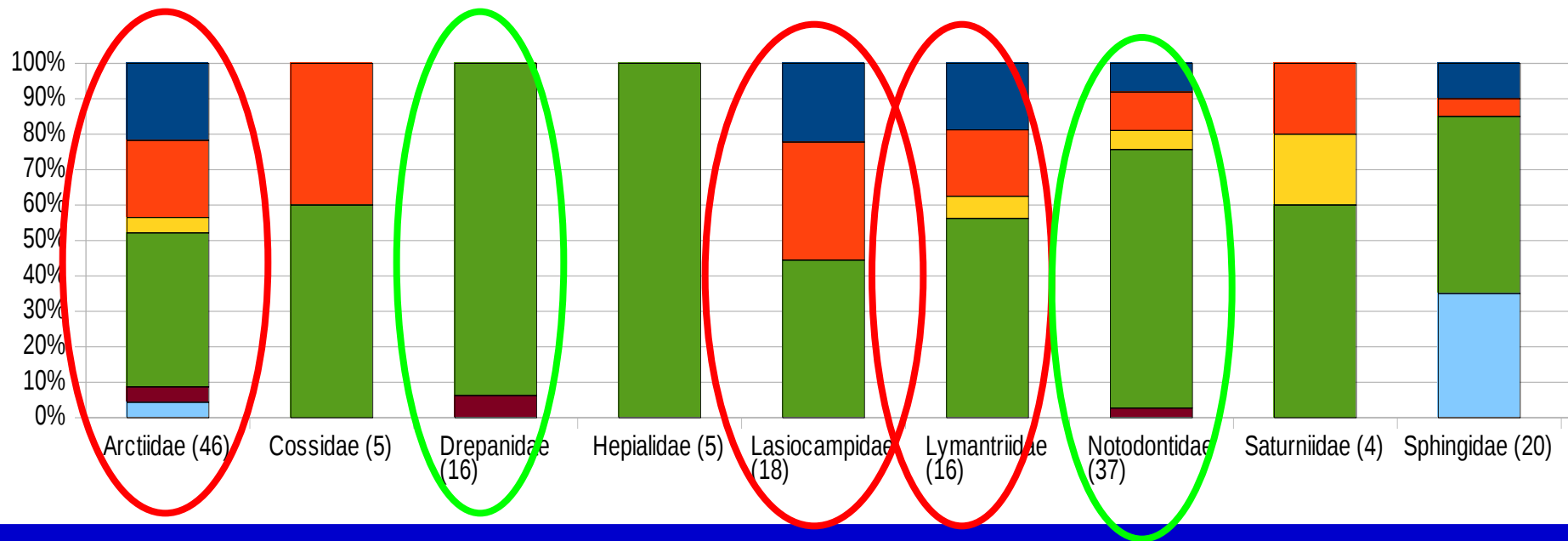
CR: over 75% loss, E: 50% loss, VU: 25% loss, EXP: over 25% gain.

~ fewer EX a CR moths

~ more expanding butterflies

~ losses still prevail

Notable taxonomic bias

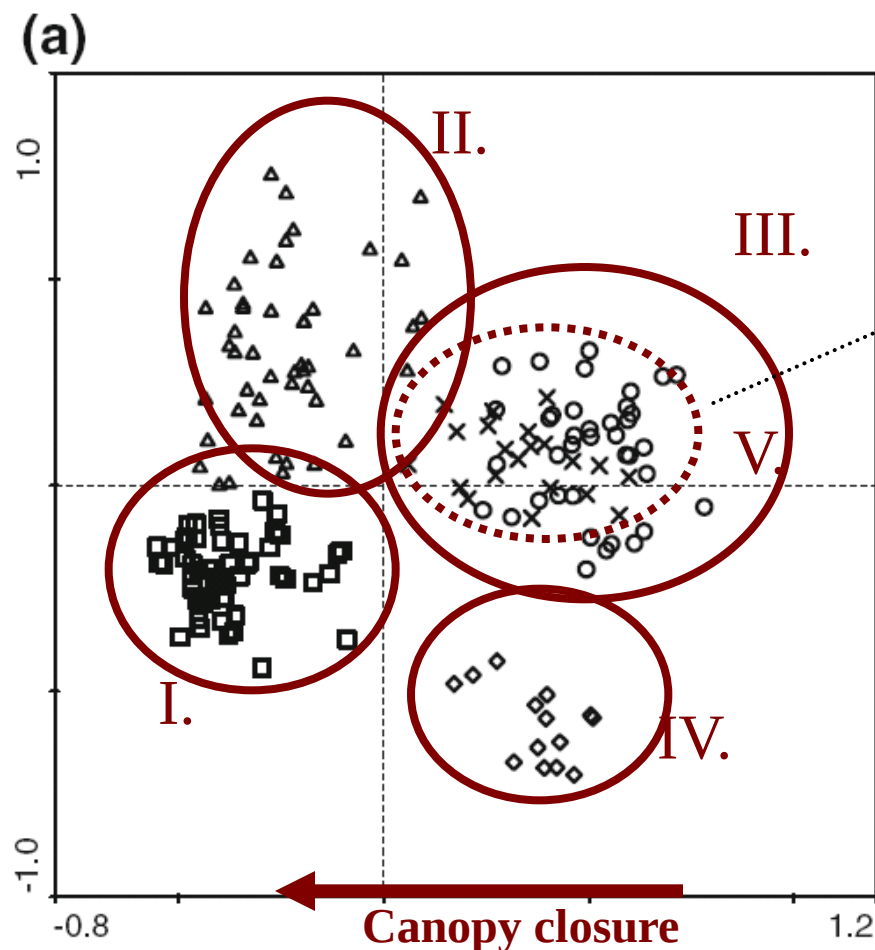


Legend: Migrant or imigrant (light blue), Increasing (dark red), Safe (green), Vulnerable (yellow), Critically endangered (orange), Extinct (dark blue)

Lose: Arctiidae
Lasiocampidae
Lymantriidae

Winners: Drepanidae
Notodontidae

Habitats: how to define them?



- I. close canopy moths
- II. open-canopy moths
- III. grassland moths
- IV. *herb-feeding sphingids*
- V. *lichen-feeders*

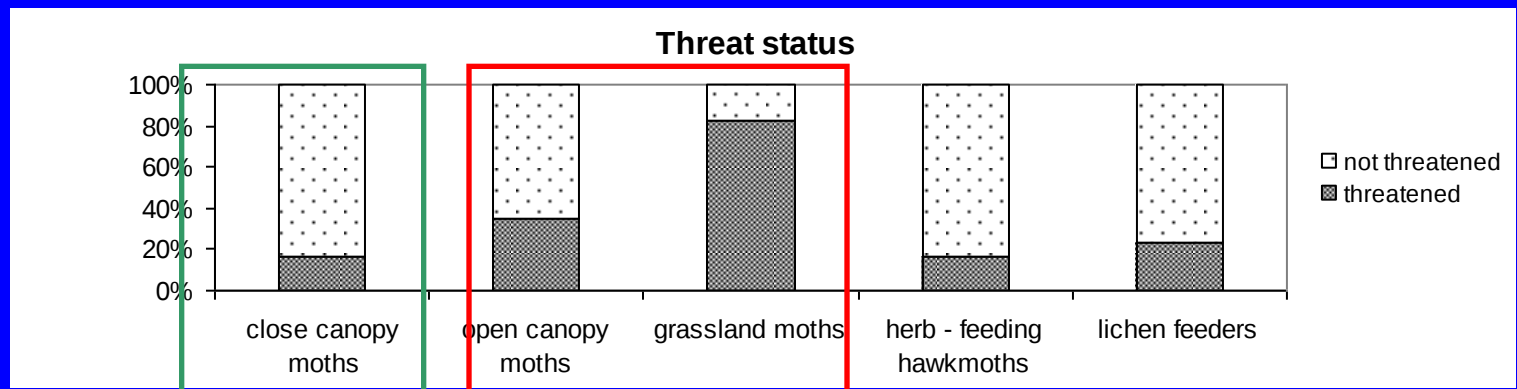
„sequel to Shreeve et al. 2001“:
multiple life-history traits, ordination to

Most likely threatened:

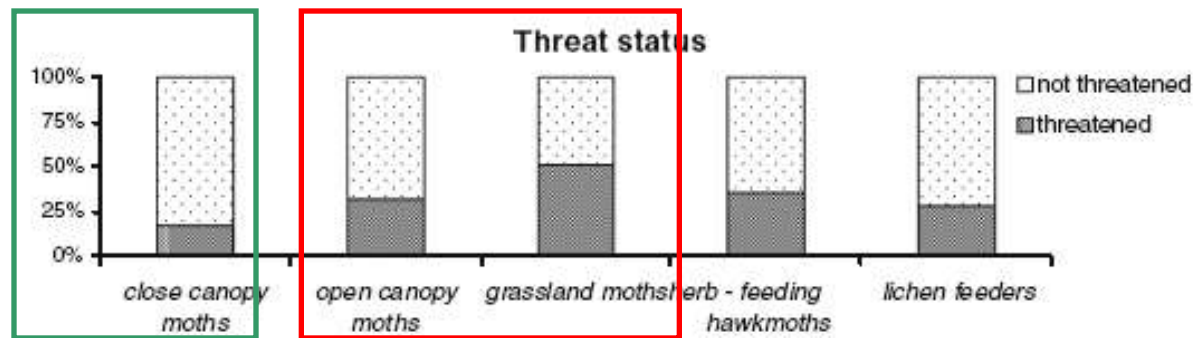
grasslands
open canopy habs.

Little threatened:

closed woodlands

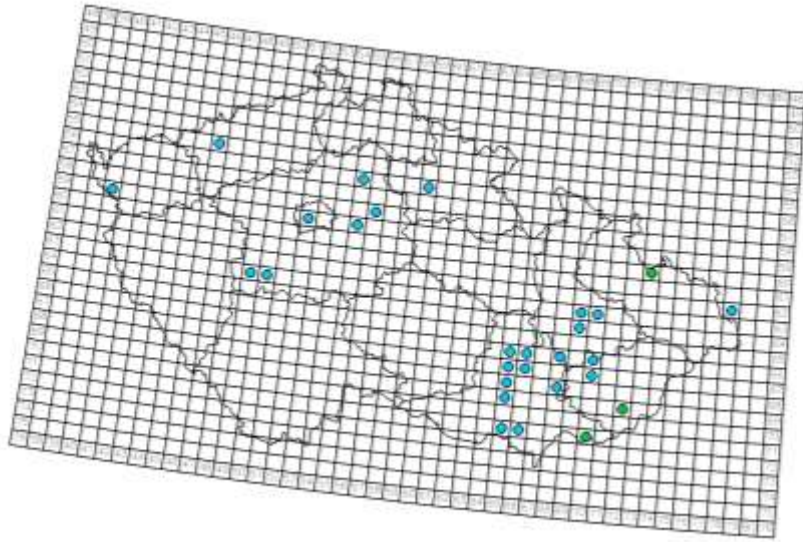


(VU species treated as non-threatened)

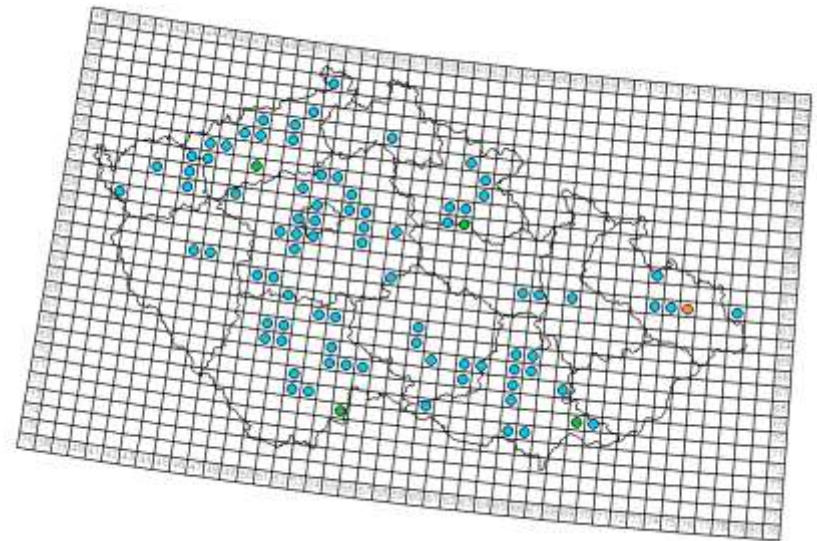


Extinct species

Pericallia matronula



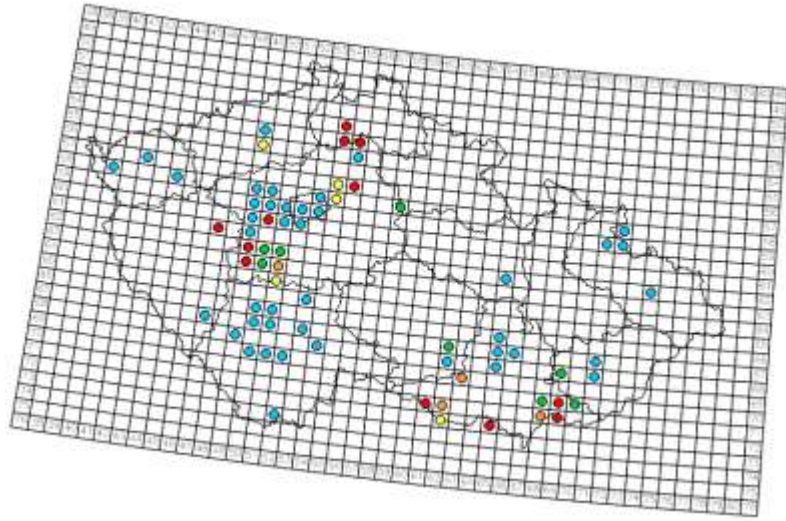
Arctia festiva (=hebe)



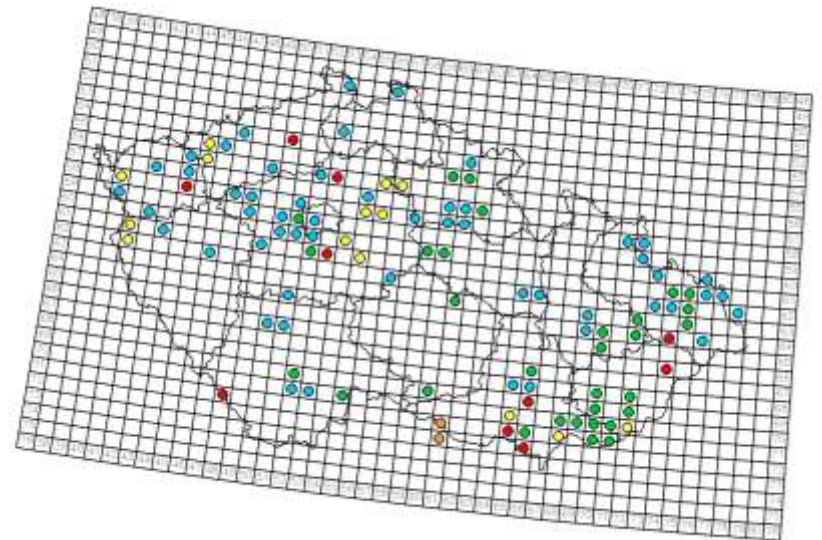
+*Saturnia spini* (open woodlands); *Pygaera timon*(dtto?); *Gynaephora selenitica* (steppes)

Critically endangered - grasslands

Spiris striata (Arctiidae) – dry

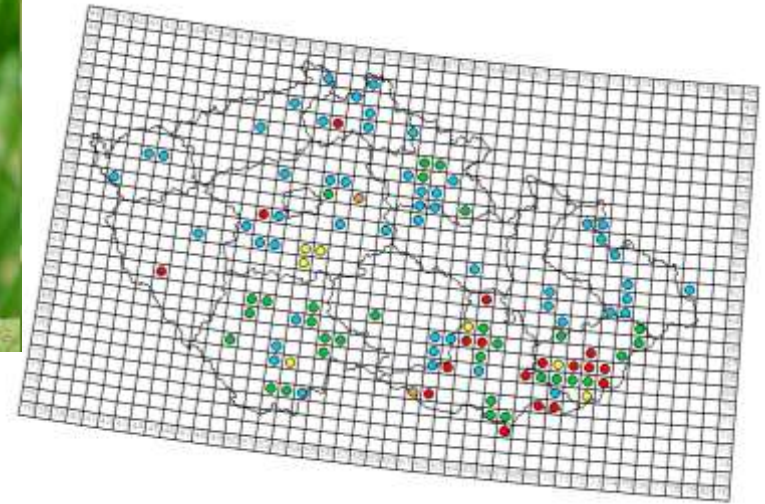


Spilosoma urticae (Arctiidae) - wet

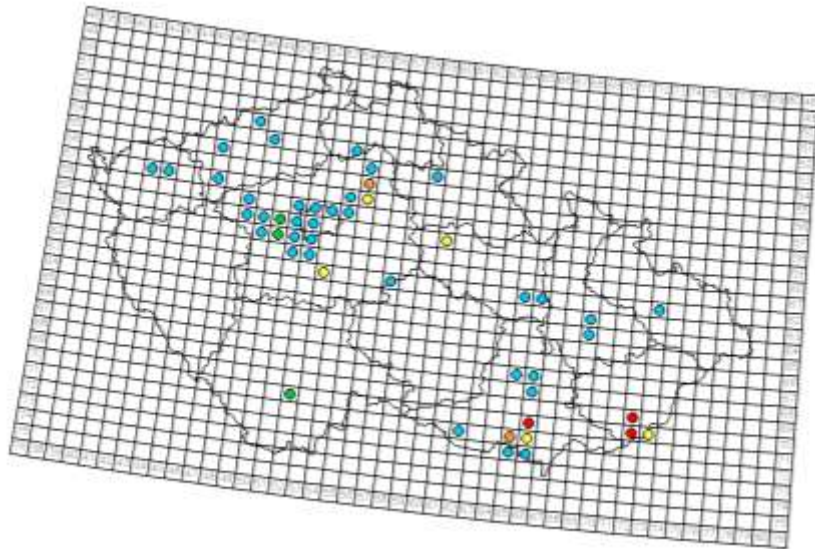


Critically endangered - grasslands

Lemonia taraxaci
(Lemoniidae) – pastroral

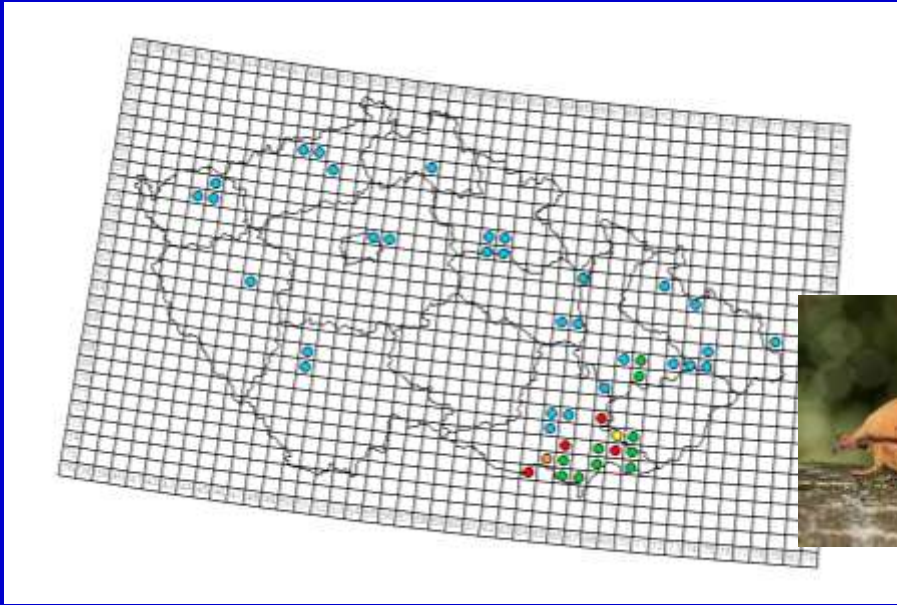


Malacosoma castrense
(Lasiocampidae) – dry steppic

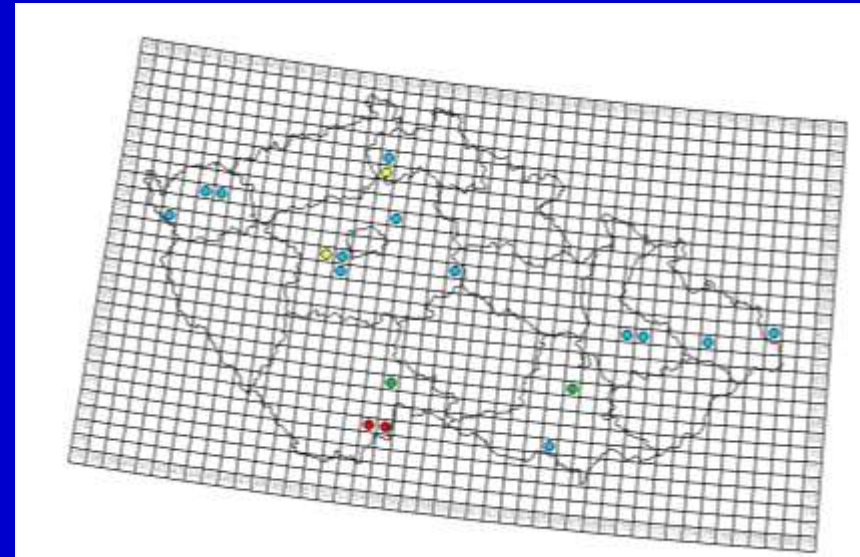


Critically endangered – open woodlands

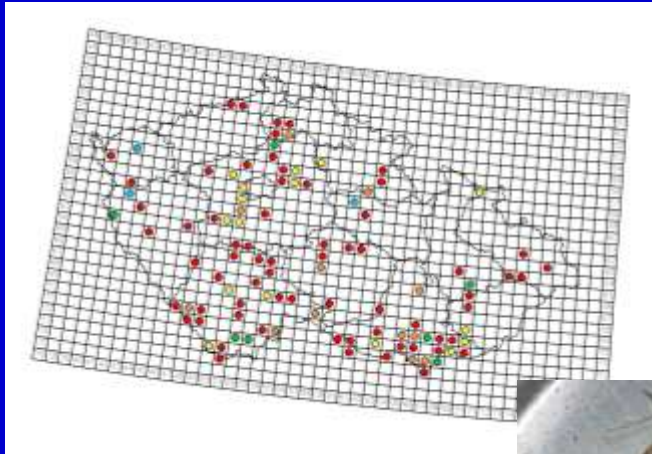
Gastropacha populifolia
(Lasiocampidae) – wet



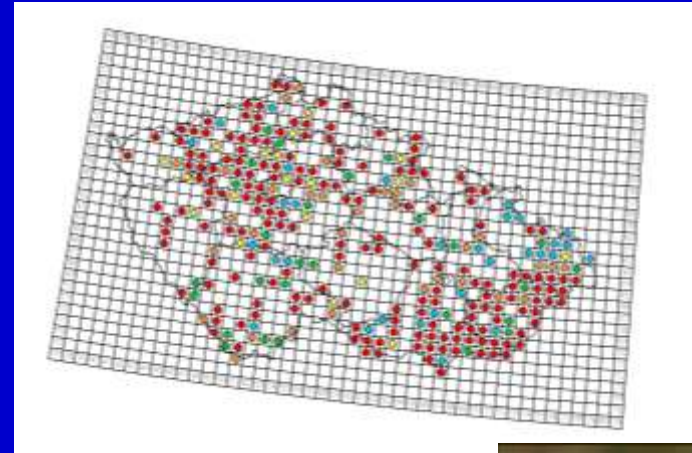
Phyllodesma ilicifolia –
(Lasiocampidae) – retreated to bogs



Expanding species – pug moths!



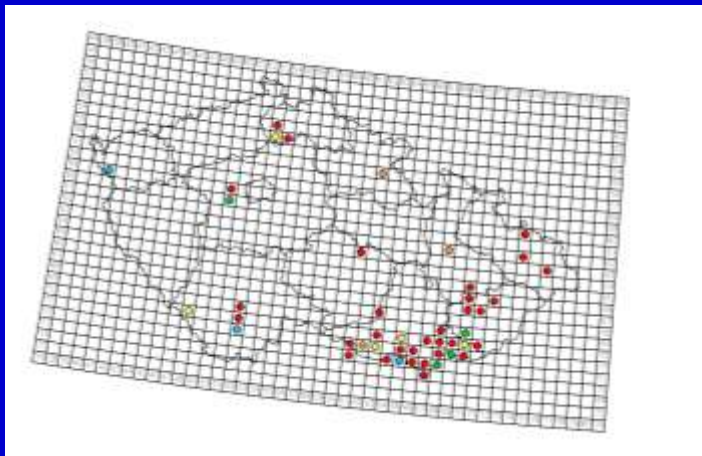
Thaumatha senex



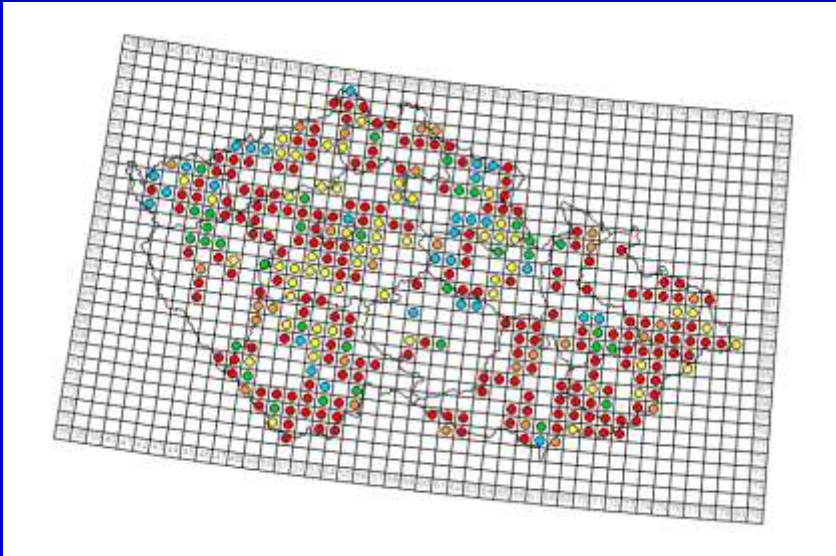
Eilema complanum



Pelosia muscerda

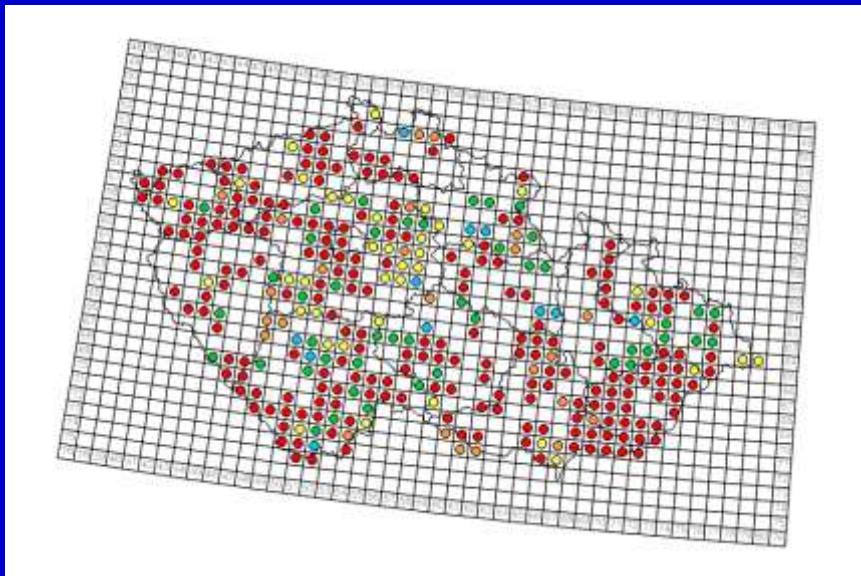


Recording record – night flying



Sphinx pinastri – Sphingidae

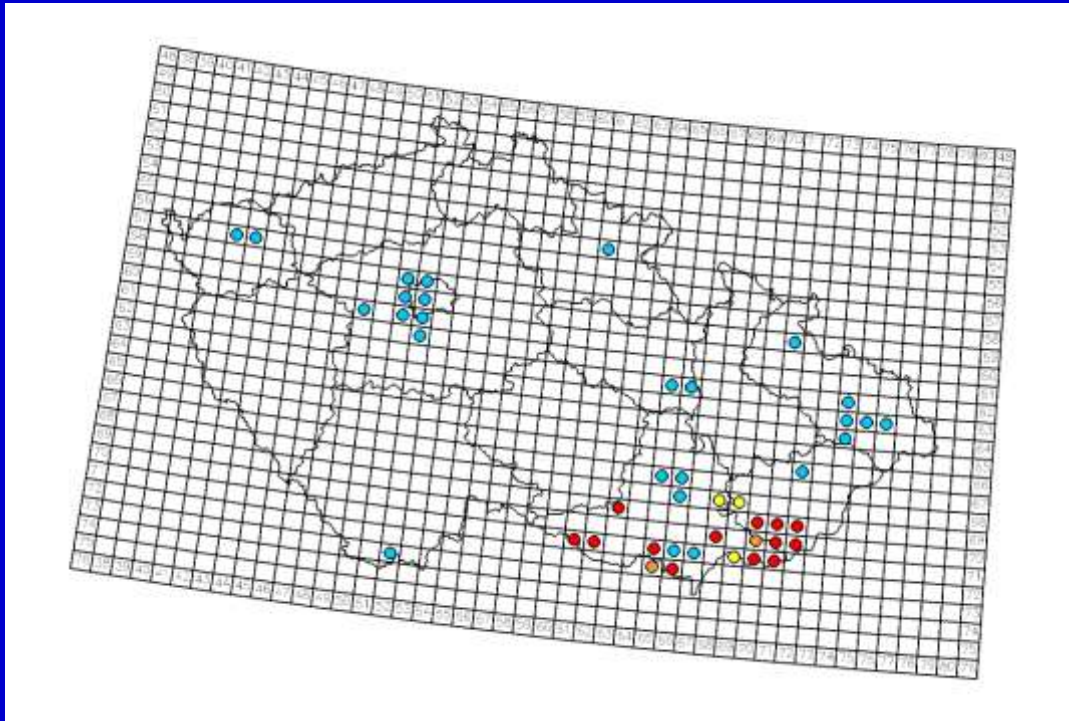
Recording record – day flying



Diacrisia sannio – Arctiidae

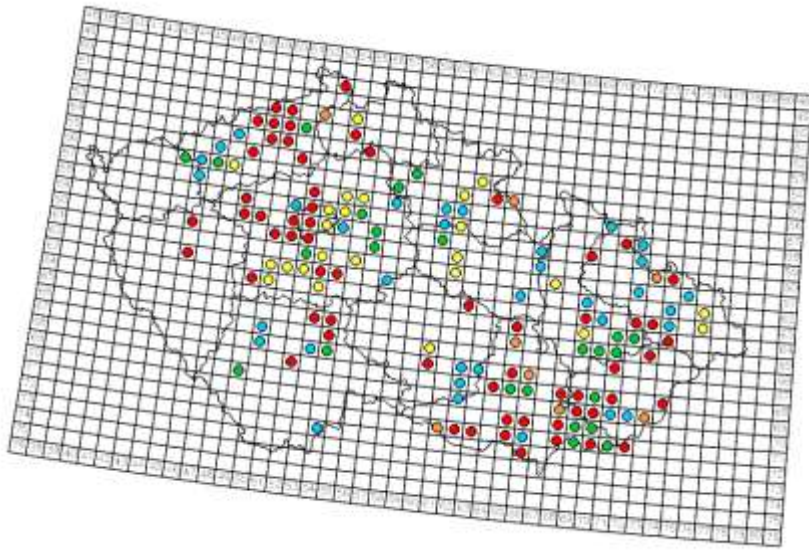
Natura 2000 species

Eriogaster catax – Lasiocampidae
Endangered



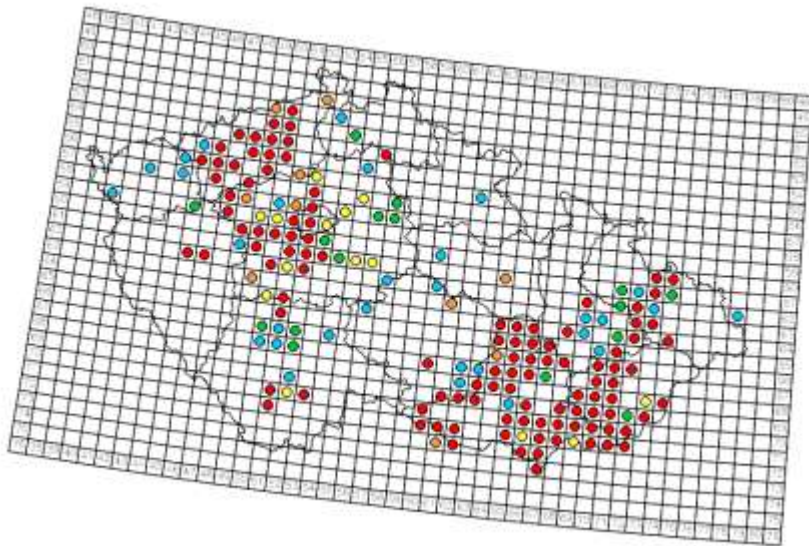
Escaped from woodlands to scrub

Natura 2000 species



Proserpinus proserpina – Sphingidae

vulnerable



Euplagia quadripunctaria – Arctiidae

not threatened



Conclusions

- fewer extinctions than in butterflies
- similar proportion of endangered species
- taxonomic signal in threats
 - (Lasiocampidae, Arctiidae, Lymantridae vs. Notodontidae)
- habitat signal in threats
 - (grassland, open woodlands vs. close woodlands)



Broader biotope scope of the moths (e.g., marshes, reed beds)

=> expanded rather than changed agenda

Atlas, planned for 2012/3, cannot match butterfly recording

=> but can guide further efforts

THANK YOU ☺