

Endangered molluscs of European fens: current data and conservation of glacial relicts

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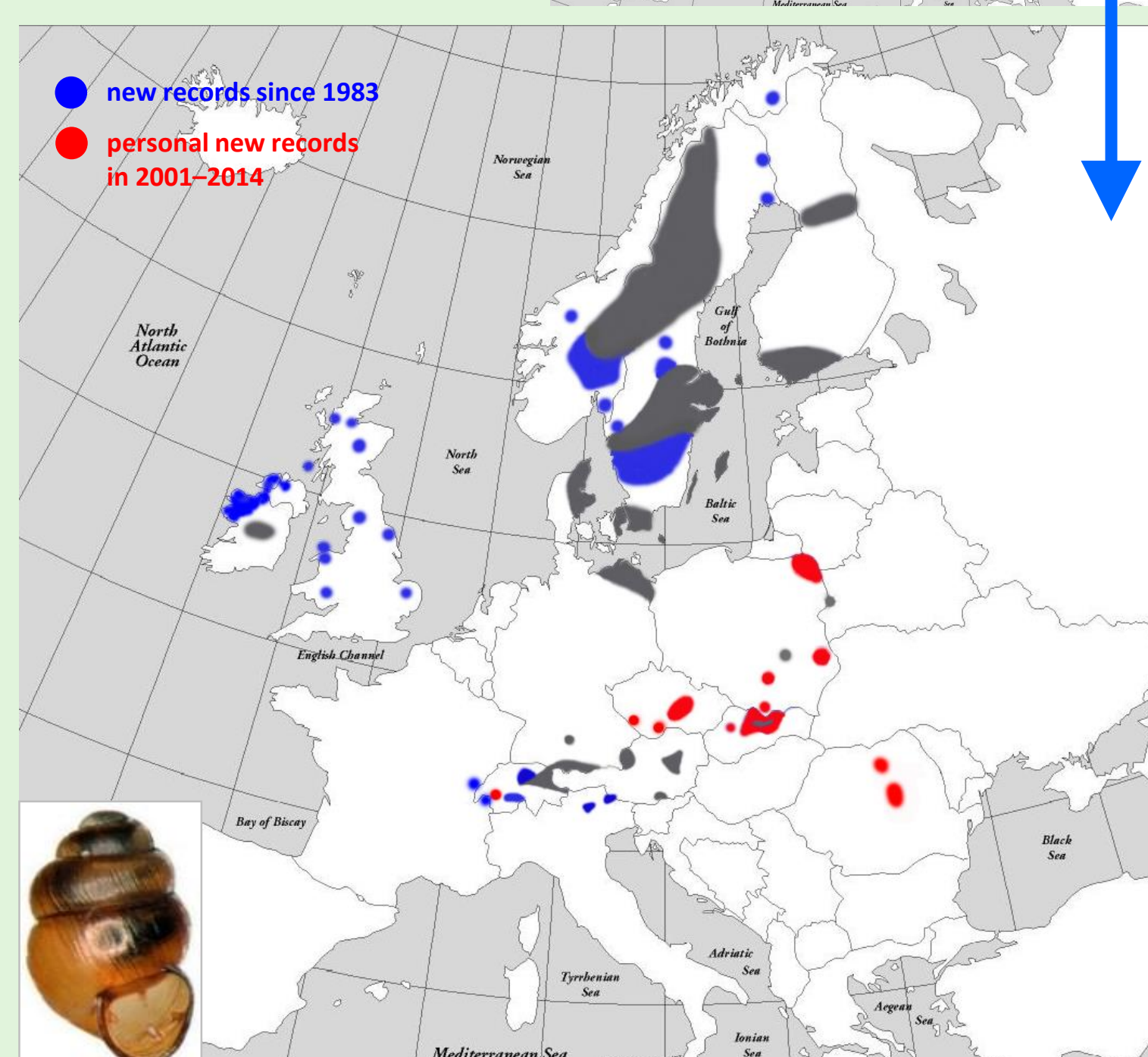
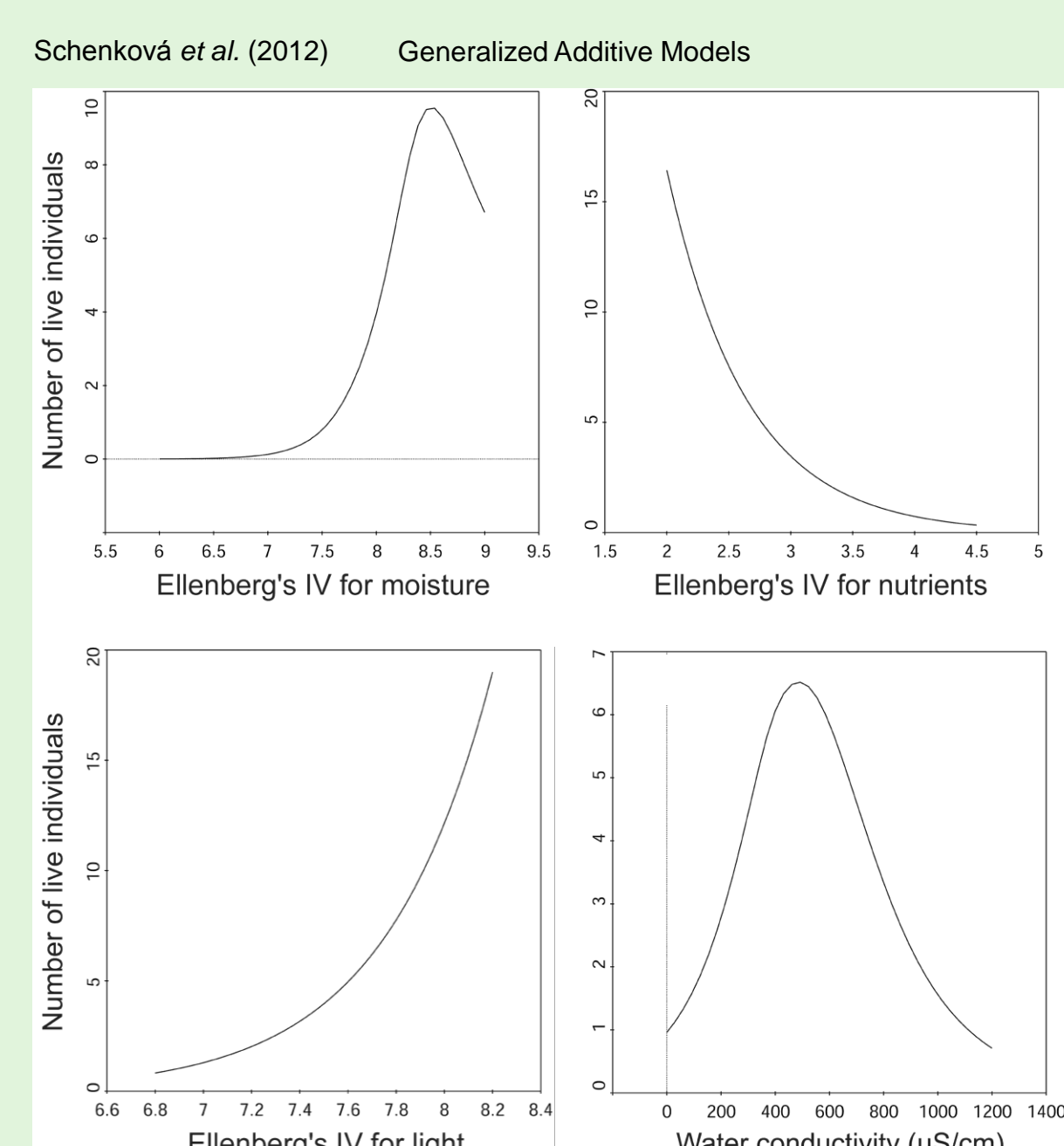
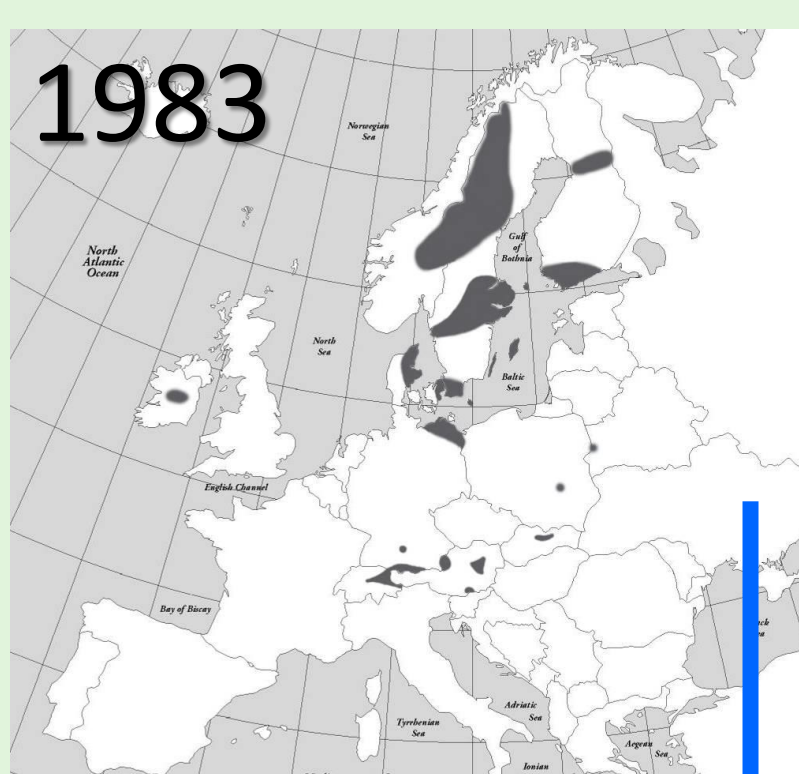
What is a fen?

Fens are low productive wetlands supplied with **groundwater**. The character of fen biota is mainly influenced by the **mineral poor-mineral rich gradient**, stretching from poor *Sphagnum*-fens to calcareous brown-moss fens with calcium carbonate precipitation.



Vertigo geyeri Lindholm, 1925

- **Annex II** species (92/43/EEC) restricted to **treeless spring fens** with stable water regime and low productive vegetation
- permanently wet fens but without seasonal over-flooding, broad ecological amplitude along the gradient of mineral richness



Fens as refugia for glacial relicts

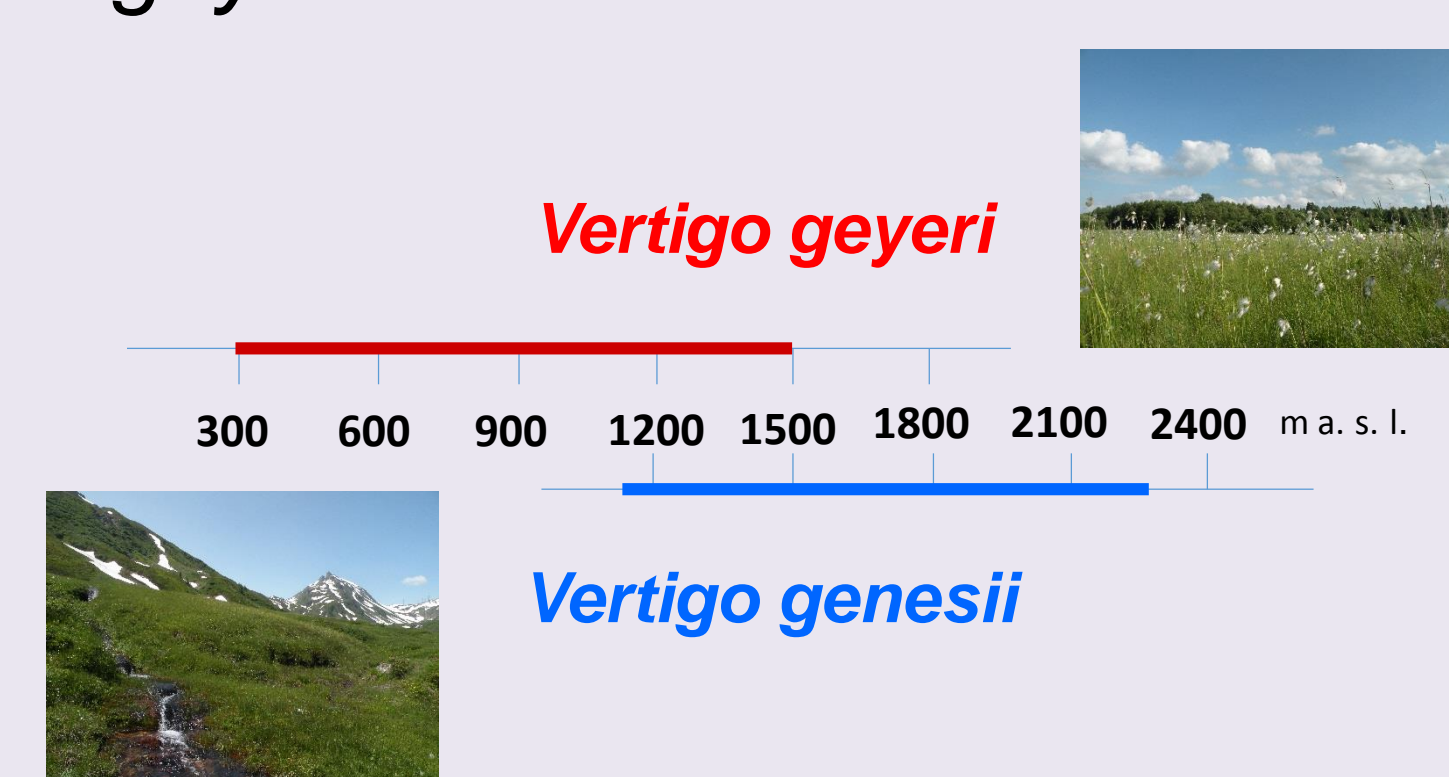
Fens are capable to sustain cooler and more humid microclimatic conditions than the surrounding landscape matrix, representing thus regional **biodiversity centers** with the occurrence of highly endangered habitat specialists and glacial relict species.

Glacial relict **land snails** with high affinity to **fens**

- mostly minute (ca 2 mm) land snails of the genus **Vertigo**
- Euro-Asian distribution, in central Europe widespread during the Late Glacial and Early Holocene
- distribution still rather poorly examined, due to close linkage to **extremely rare habitat type**

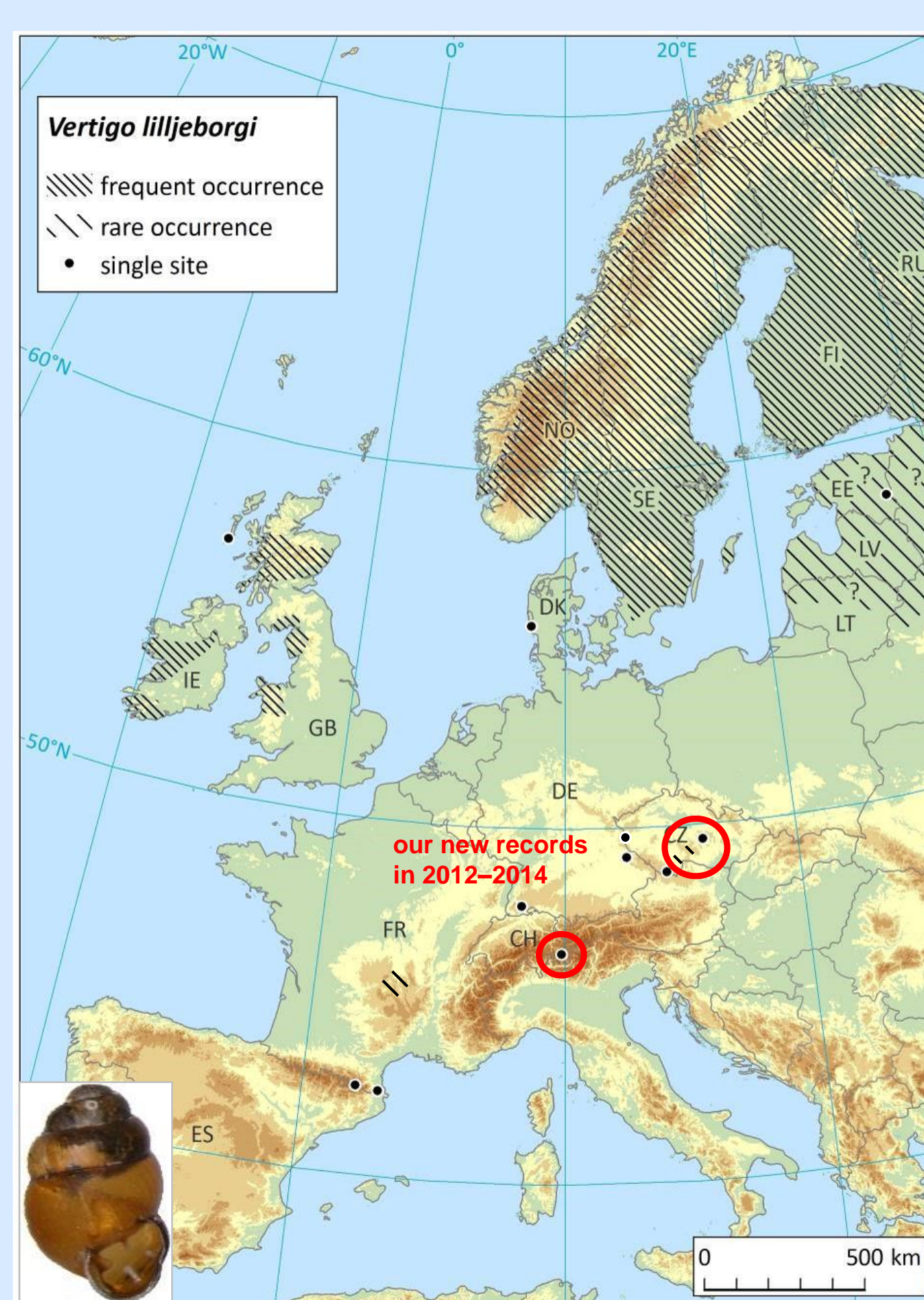
Vertigo genesii (Gredler, 1856)

- **Annex II** species
- ecologically resembles *V. geyeri*, but is confined to cooler, **more extreme** climatic conditions
- in central Europe **only in the Alps**, above ca 1100 m a. s. l., only rarely co-occurring with *V. geyeri*



Vertigo lilljeborgi (Westerlund, 1871)

- widespread in **northern Europe**; in central Europe **extremely rare** (only a few scattered sites)
- strongly **hygrophilous**, open *Carex* marshes, fens and swamps, often subjected to over-flooding
- **unique ecology**: it prefers much more acidic, **calcium-poor conditions** than the vast majority of the European land snail fauna
- first record for the **Alps** and several new records for **Bohemian Massif** since 2012



Major threats for land snail fen specialists

→ high affinity to one of the **most seriously threatened ecosystems** of the temperate zone!

- **changes in the water regime**, groundwater-level fluctuations
- nutrient enrichment (**eutrophication**)
- **cessation of traditional management** practices (pasture or mowing)
 - secondary succession towards more productive meadow, shrub or forest vegetation, loss of sensitive fen specialists and rare plant and animal communities restricted to open, low-productive fens
- **the tendency to degradation and need for management stems from the long-term human impact on fen habitats!**

