

Do not fly blindly into the night



How landscape parameters and species specific traits can be used for exposure scenarios in the risk assessment for European bat species

INTRODUCTION

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Bats form the second largest group of mammals and provide important ecosystems services from pollination to seed dispersion, whereas in Europe they play a vital role in the control of agricultural pests. All European bats species are protected by law under 'The Convention on Migratory Species' (UNEP/CMS). However, bats are not specifically mentioned in the current risk assessment for plant protection products (PPPs), although their habitat preferences and hunting behaviour may lead to an exposure to PPPs. EFSA states that bats are not sufficiently covered by the current risk assessment for birds and mammals.

Problem statement

European bat species are not dependent on or closely associated with farmland. Furthermore, bat species in Europe vary greatly in their **occurrence**, **mode of living**, and **foraging behaviour**.

A definition of exposure scenarios based on specific crops is not meaningful. It is crucial to take the specific biology of bats into account.

Occurrence

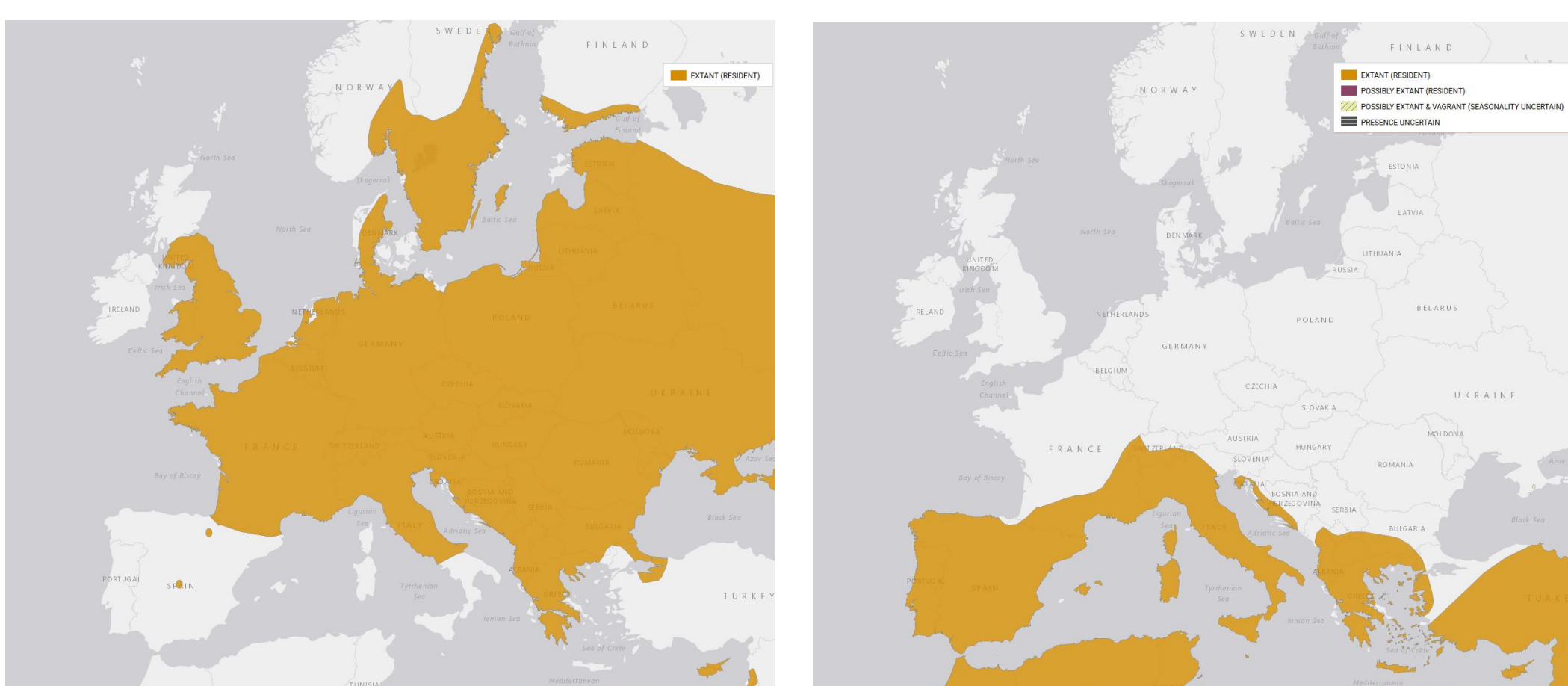


Fig. 1: Distribution areas of the common noctule (*Nyctalus noctula*) (left) and the European free-tailed bat (*Tadarida teniotis*) (right). (source of maps: <https://www.iucnredlist.org/>)

Foraging behaviour

Hunting style

- Gleaning of ground- or leaf-dwelling arthropods
- Aerial hawking of flying insects
- Opportunistic (mixed) foraging behaviour

Hunting habitat

- Open areas
- Structured landscapes
- Forests
- Close to water bodies

Hunting height

- Low above the ground or water body
- Close to vegetation
- High above the ground or above canopies



Fig. 2: Habitat preferences (clockwise): water body in forest, structured landscape, open agricultural landscape, park. (pictures by Nils Kehrein and Ines Hotopp)

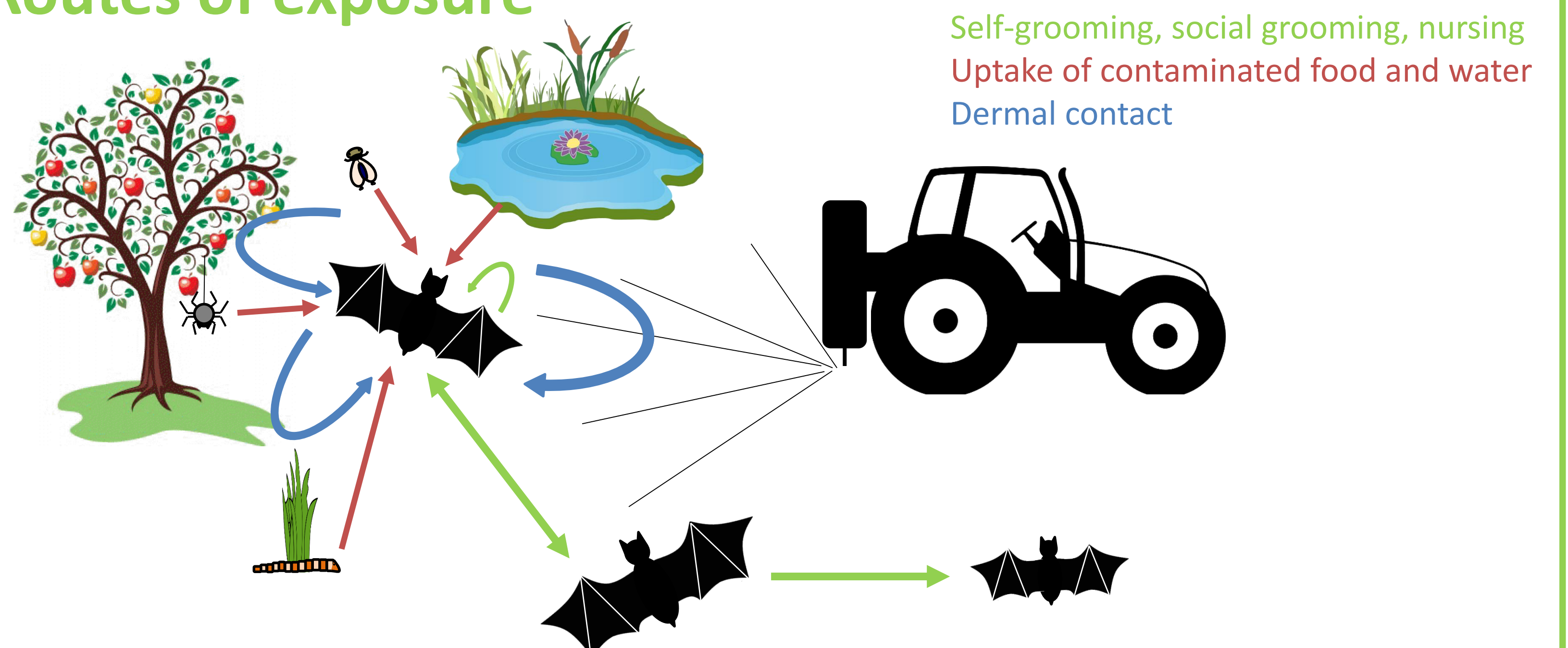
Mode of living

- Migration behaviour (e.g. long- or short-distance migration)
- Synanthropy
- Roost preferences

Required information

- Occurrence of arthropods of the different categories in agricultural fields
- Vegetation structure of different crop groups (e.g. field crops, permanent cultures) and their suitability as foraging habitat for different hunting guilds
- Match between the regional cultivation patterns and bat species distribution

Routes of exposure



RESULTS & CONCLUSIONS

- European bats are not closely associated with agricultural fields, however they will use agricultural areas as foraging habitat, if they provide suitable conditions according to the needs of the different feeding guilds.
- Instead of a crop-related approach exposure scenarios should be based on regional distributions, habitat preferences, feeding and hunting behaviour.



Current data and information availability is not sufficient for landscape-based population modelling to incorporate species specific traits and behavior, but it might become a useful tool in the future.

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