

# Pollination as Ecosystem Service

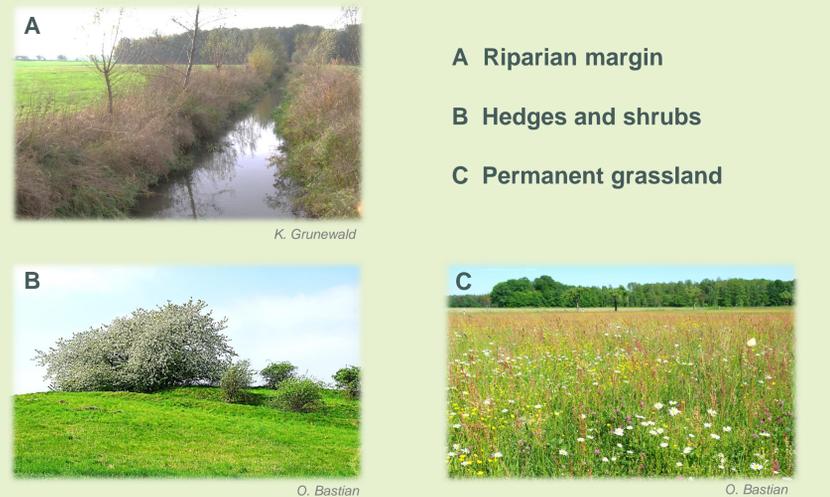
## The Pollination Potential of Wild Bees in Germany – Suggestion for a new Monitoring Indicator

Sophie Meier, Ulrich Walz, Ralf-Uwe Syrbe, Karsten Grunewald

### Background

- Wild bees are considered as important pollinators of agricultural plants. Semi-natural habitats in agricultural land, like hedges, stream margins and permanent grassland, provide important nesting and foraging areas for wild bees (see photos below).
- For assessing the pollination potential of the German land cover, we used the German land cover model („LBM-DE“), which is issued by the German Federal Agency of Cartography and Geodesy (BKG) every three years.
- In the LBM-DE we enhanced the level of detail regarding semi-natural habitats, regarding to **Zulian et al. (2013)**. We incorporated **small-scale structure elements** (hedges, tree rows, rocks) and **infrastructure elements** (lanes, roads, railway lines, water courses) from the German topographic–cartographic information system („ATKIS“) into the LBM-DE. Also, **margins** along structures elements, forests and standing water bodies were added. All items considered were categorized according to the CORINE Land Cover classification.

### Semi-natural habitats with good foraging and nesting conditions for wild bees



### Assessing the Pollination Potential using the example of Dubring Fen („Dubringer Moor“, Saxony)

- Fig. 1 (below) and Fig. 2 (right side) show the same map section of the Dubring Fen.
- Fig. 1 illustrates the land cover types.
- Fig. 2 displays the **potential floral availability** and the **nesting sites** of the land cover types (raster data: 5x5m). Both datasets are processed with an **average flight distance of 200 m** to gain the relative pollination potential as to short-distance solitary bees.

#### Legend

- Settlement/artificially mod. areas
- Non-irrigated arable land
- Pasture, meadow, agricult. use
- Natural grassland
- Transitional woodland/shrub
- Broad-leaved forest
- Mixed forest
- Coniferous forest
- Inland marshes
- Water courses/bodies

Data Source: Adv 2015, BKG 2018

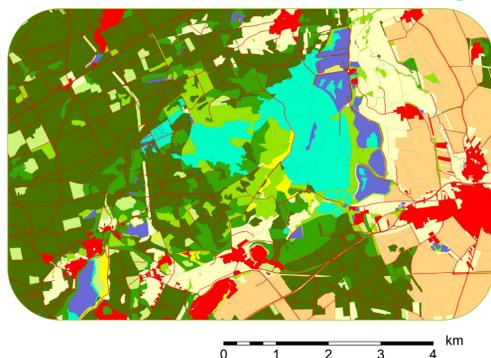
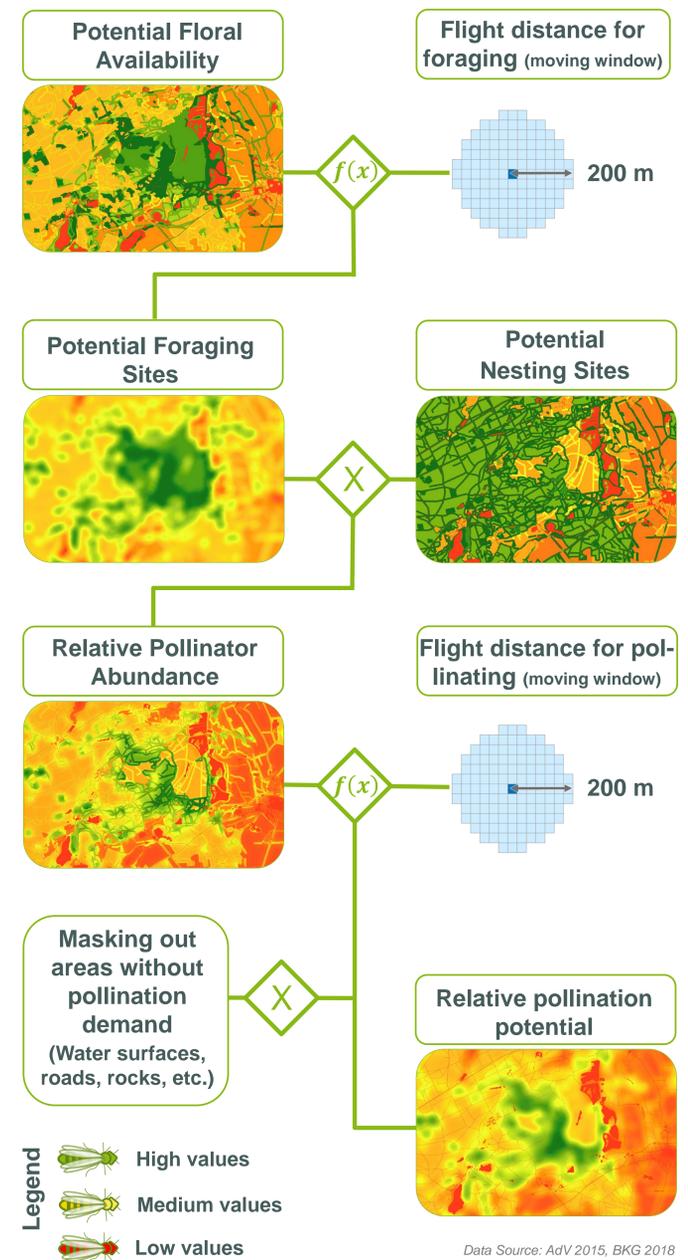


Fig. 1

### Calculation steps

Fig. 2



### Conclusion

- The integration of further elements into the LBM-DE dataset improves the accuracy of the model, because it **represents more adequately the value of the habitat** (valuable food and nesting sites).
- For long-term monitoring, geodata should be used that are **regularly collected on the scale of interest**. LBM-DE and ATKIS are currently the only datasets which meet these requirements. In addition, data from the Federal Forest Inventory („BWI“) and from the agricultural statistics on cultivated crops („DESTATIS“) could be integrated.

### References / Data Sources

- Adv – Working committee of the surveying authorities of the Laender of the Federal Republic of Germany 2015: Documentation on the Modelling of Geoinformation of Official Surveying and Mapping (GeoInfoDoc). Main document. Version 7.0.2, 182 p.
- BKG – German Federal Agency of cartography and geodesy 2018: Digitales Landbedeckungsmodell für Deutschland [Digital land cover model for Germany]. LBM-DE 2015, 52 p.
- Zulian, G., Maes, J., Paracchini, M.L. 2013. Linking land cover data and crop yields for mapping and assessment of pollination services in Europe. Land 2, 472-492.