

Responses of bees and wasps to urbanization

Joan Casanelles Abella^{1,2}, Loïc Pellissier^{2,3} & Marco Moretti¹

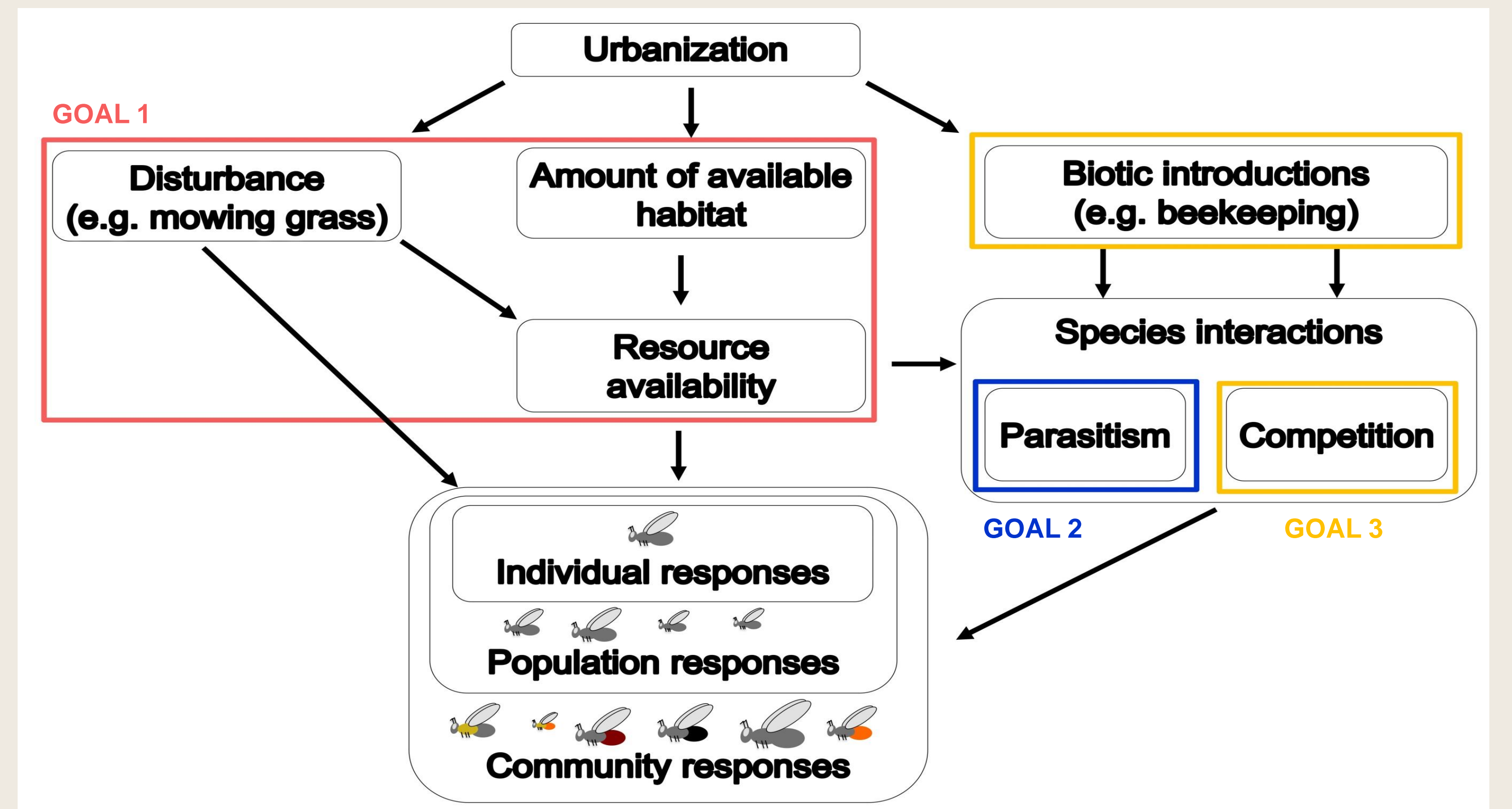
¹ Swiss Federal Research Institute WSL, Biodiversity and Conservation Biology ² ETH Zürich, Institute of Terrestrial Ecosystems ³ Swiss Federal Research Institute WSL, Landscape Dynamics

Joan.casanelles@wsl.ch



BACKGROUND

- Urbanization drives the decline of several insect pollinator species.
- The amount, **composition** and **configuration** of urban green infrastructure (UGI) can alleviate the effects of urbanization at different spatial scales by enhancing **connectivity** or increasing **resource availability**¹.
- Cavity-nesting bees and wasps (CNBW) and their antagonists represent a specialist umbrella guild with complex **host-antagonist interactions** that are sensitive to urbanization.²
- Urban beekeeping** is an increasing practice in cities but the effects on the rest of the bee community are yet poorly studied.^{3,4,5}

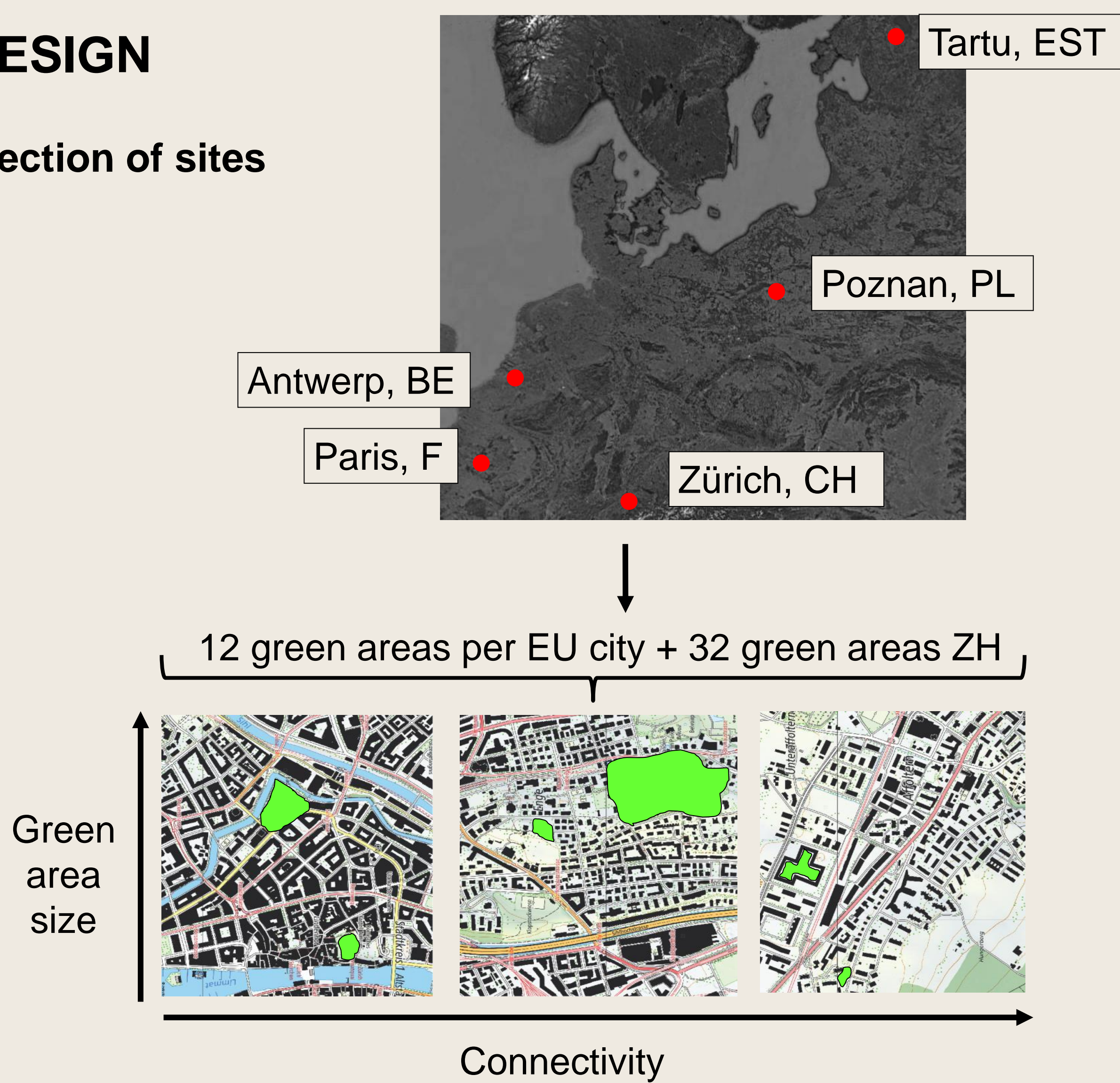


GOALS

- 1:** Test the effects of UGI on CNBW at different spatial scales.
- 2:** Study host-antagonist interactions in CNBW along urbanization gradients.
- 3:** Investigate the effects of urban beekeeping on the wild bee community.

DESIGN

Cities & selection of sites



Sampling

1 trap-nests / site



Data type



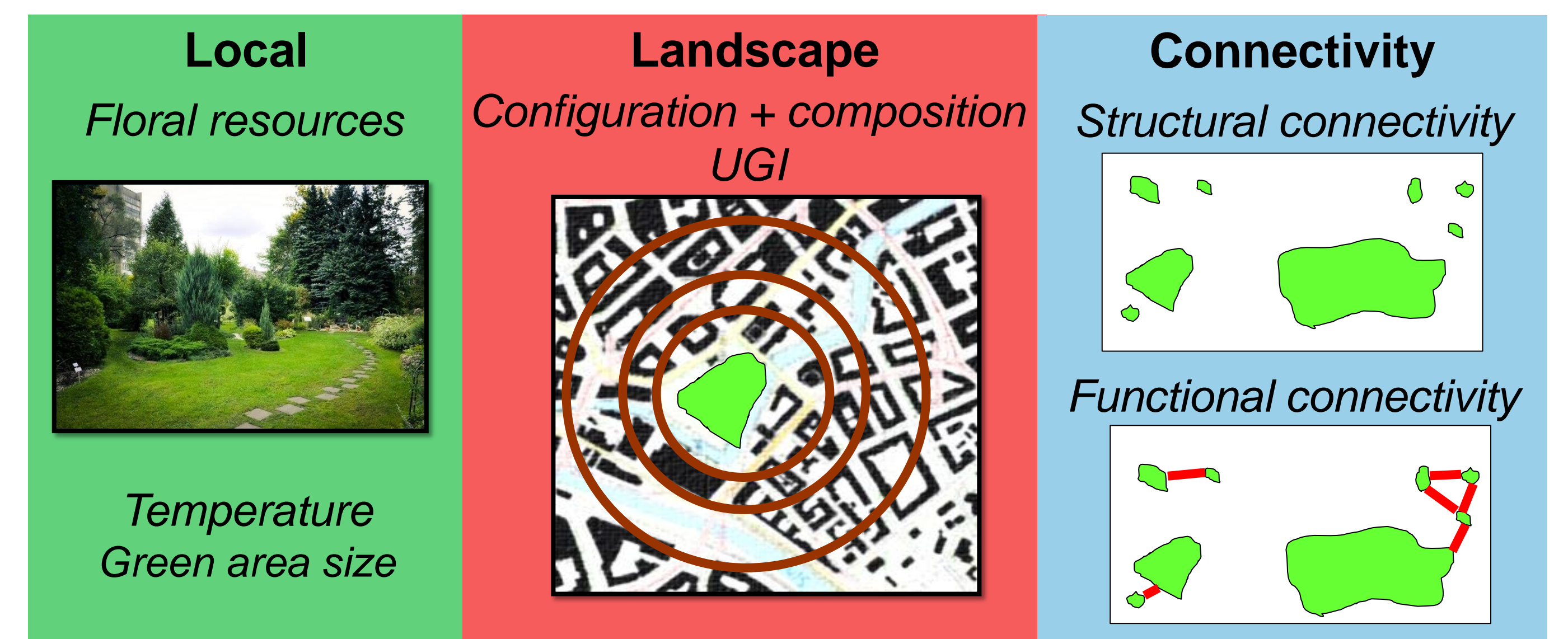
GOAL 1

Spatial scale = EU + ZH

Responses

COMMUNITY	FITNESS	FUNCTIONAL
Abundance Diversity Richness	Reproduction Sex ratio Parasitism rate	Trait diversity Groups

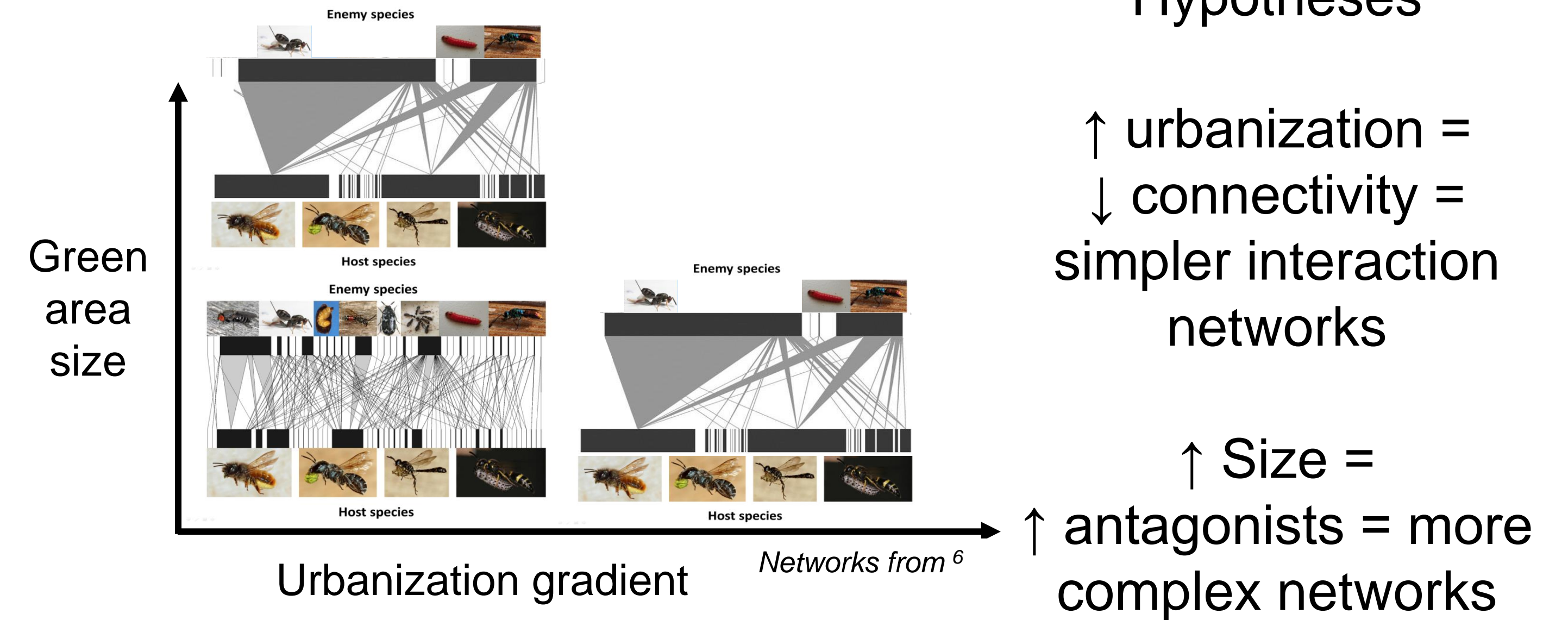
Predictors



GOAL 2

Spatial scale = EU + ZH

Hypotheses



GOAL 3

Spatial scale = ZH

Responses

Aggressive interactions
Flower visitation rates
Community data

Predictors

Landscape metrics
Honeybee density/abundance

Hypothesis

↑ urbanization & ↓ landscape heterogeneity = ↑ competition

REFERENCES

- European Commission, 2013b, Building a green infrastructure for Europe. Publ. Office of the European Union, Luxembourg
- Banaszak-Cibiicka & Żmihorski, 2012. Wild bees along an urban gradient: winners and losers. *Journal of Insect Conservation* 16, 331–343.
- Torné-Noguera *et al.*, 2015. Collateral effects of beekeeping: Impacts on pollen-nectar resources and wild bee communities. *Basic and Applied Ecology* 17, 199-209
- Geslin *et al.*, 2017. Massively Introduced Managed Species and Their Consequences for Plant–Pollinator Interactions. *Advances in Ecological Research*
- Geldmann & González-Varo, 2018. Conserving honey bees does not help wildlife. *Science* 359, 392-393
- Tylianakis *et al.*, 2007. Habitat modification alters the structure of tropical host–parasitoid food webs. *Nature* 445, 202–205

SPONSORS

