



**HAL**  
open science

## **Beekeep calm and think common. A game for the governance of floral resources use among beekeepers**

Léo Mouillard-Lample, Gabriel Gonella, Christophe Le Page, Mickaël Henry, Axel Decourtye, Cécile Barnaud

### ► **To cite this version:**

Léo Mouillard-Lample, Gabriel Gonella, Christophe Le Page, Mickaël Henry, Axel Decourtye, et al.. Beekeep calm and think common. A game for the governance of floral resources use among beekeepers. IALE 2022 European Landscape Ecology Congress, Institute of Geography and Spatial Organization, Polish Academy of Sciences (IGiPZ PAN); Faculty of Geography and Regional Studies, University of Warsaw (WGiSR UW), Jul 2022, Online, Poland. <hal-04166148>

**HAL Id: hal-04166148**

**<https://hal.science/hal-04166148v1>**

Submitted on 19 Jul 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY 4.0 - Attribution - International License

# Beekeep calm and think common. A game for the governance of floral resources use among beekeepers

Authors: Léo Mouillard-Lample<sup>1,2,3,4</sup>, Gabriel Gonella<sup>5</sup>, Christophe Le Page<sup>6</sup>, Mickaël Henry<sup>1,2</sup>, Axel Decourtye<sup>2,3</sup> and Cécile Barnaud<sup>5</sup>

<sup>1</sup> INRAE, UR406, Abeilles et environnement, Avignon, France

<sup>2</sup> UMT PrADE, Avignon, France

<sup>3</sup> ITSAP-Institut de l'abeille, Avignon, France

<sup>4</sup> Université d'Avignon, Avignon, France

<sup>5</sup> INRAE, UMR 1201, DYNAFOR, Toulouse, France

<sup>6</sup> CIRAD, UMR SENS, Montpellier, France

Corresponding author: Mouillard-Lample, Léo [leo.mouillard-lample@inrae.fr](mailto:leo.mouillard-lample@inrae.fr)

Bees play a key role in providing ecosystem services such as pollination. However, recent ecological studies suggest honey bee colonies compete with wild bees (Geslin et al. 2017; Henry et Rodet 2018). Exploitative competition for floral resources reveals antagonism between ecosystem services provided by honey bees - i.e. pollination, honey production - and those provided by wild bees – pollination and existence value of wild pollinators. In natural areas, beekeeping practices are seen as a source of ecosystem disservices that raised tensions over the shared harvesting of floral resources.

While existing studies have focused on ecological aspects of competition for floral resources, the present study explores floral resources management governance in a socio-ecological perspective (Ostrom 2009). To this end, we draw on a conceptual framework combining collective action theories on common-pool resources management (Ostrom 1990) and the concept of ecosystem services (Barnaud et al. 2018). We applied this framework to analyze the social interdependencies among beekeepers within the area of Cévennes national park, southern France. To turn it into action, and accompany new forms of floral resource governance, we adopted a companion modeling approach (ComMod), a post-normal science methodology based on co-construction of simulation models (Antona et al. 2003). We built a role-playing game based on 35 beekeepers' interviews, and organized 4 gaming workshops. The gaming sessions highlighted the dilemma between individual and collective interest in harvesting resources. Despite some interactions that revealed their awareness of some kind of interdependencies over floral resources, this paradigm shift appeared cognitively dissonant for them. The high degree of uncertainty, concerning resource production and carrying capacity of the environment, are major obstacles to collective organization. It affects the actors' motivation for a collective action that seems difficult to articulate with the temporal constraints of their activity. Beyond motivation, trust towards the other actors is crucial for transparency, and identifying the right facilitators and the right decision-making arenas are critical questions. Nevertheless, some participants were willing to move towards more transparent collective organization.

Floral resource management between beekeepers appears as a textbook case of common-pool resource governance in relation to ecosystem services. Combining social and ecological aspects, we hope to contribute to the emergence of operational resource sharing solutions, stemming from the local beekeepers themselves. It appears now crucial to explore further new forms of governance of floral resources that will reconcile beekeeping and wild bee conservation, in conjunction with agriculture and land managers who largely shape these resources.

- Antona, Martine, Patrick D'Aquino, Sigrid Aubert, Olivier Barreteau, Stanislas Boisseau, François Bousquet, William's Daré, et al. 2003. « Our Companion Modelling Approach ». *Journal of Artificial Societies and Social Simulation* 6 (1). <https://www.jasss.org/6/2/1.html>.
- Barnaud, Cécile, Esteve Corbera, Roldan Muradian, Nicolas Salliou, Clélia Sirami, Aude Vialatte, Jean-Philippe Choisis, et al. 2018. « Ecosystem services, social interdependencies, and collective action: A conceptual framework ». *Ecology and Society* 23 (mars). <https://doi.org/10.5751/ES-09848-230115>.
- Geslin, B., B. Gauzens, M. Baude, I. Dajoz, C. Fontaine, M. Henry, L. Ropars, O. Rollin, E. Thébault, et N. J. Vereecken. 2017. « Chapter Four - Massively Introduced Managed Species and Their Consequences for Plant–Pollinator Interactions ». In *Advances in Ecological Research*, édité par David A. Bohan, Alex J. Dumbrell, et François Massol, 57:147-99. Networks of Invasion: Empirical Evidence and Case Studies. Academic Press. <https://doi.org/10.1016/bs.aecr.2016.10.007>.
- Henry, Mickaël, et Guy Rodet. 2018. « Controlling the Impact of the Managed Honeybee on Wild Bees in Protected Areas ». *Scientific Reports* 8 (1). <https://doi.org/10.1038/s41598-018-27591-y>.
- Ostrom, Elinor. 1990. *Governing the Commons : The Evolution of Institutions for Collective Action*. Cambridge ; New York : Cambridge University Press.  
<http://archive.org/details/governingcommons0000ostr>.
- . 2009. « A General Framework for Analyzing Sustainability of Social-Ecological Systems ». *Science* 325 (5939): 419-22. <https://doi.org/10.1126/science.1172133>.