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Ecosystem services related to small forests in temperate rural landscapes

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Ecosystem services related to small forests in temperate rural landscapes

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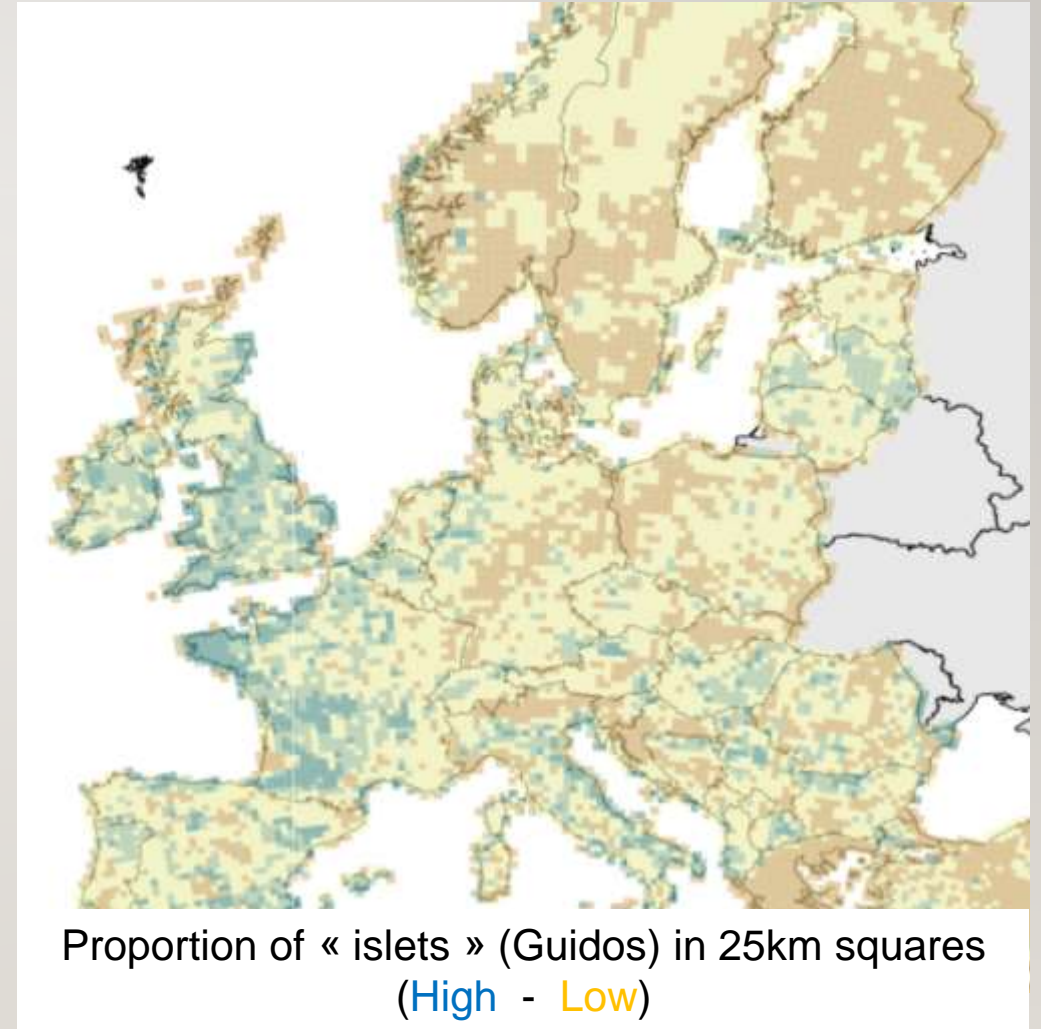
ESP10- Hanovre- 21-25/10/2019



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So many small forest fragments in rural landscapes



Lots of interactions with surrounding agriculture and other human activities

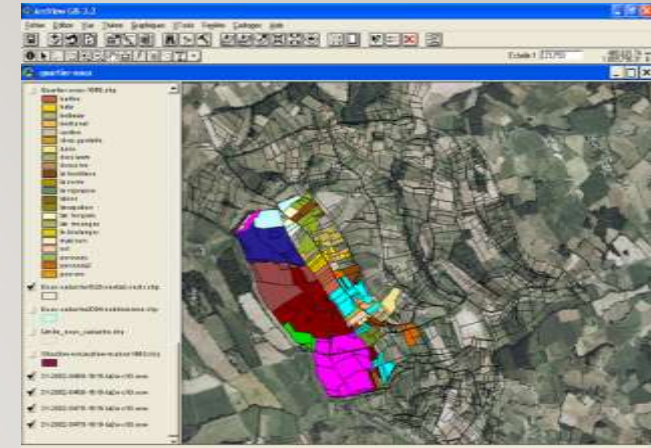


Study sites and methods



ZA-LTSER Pygar

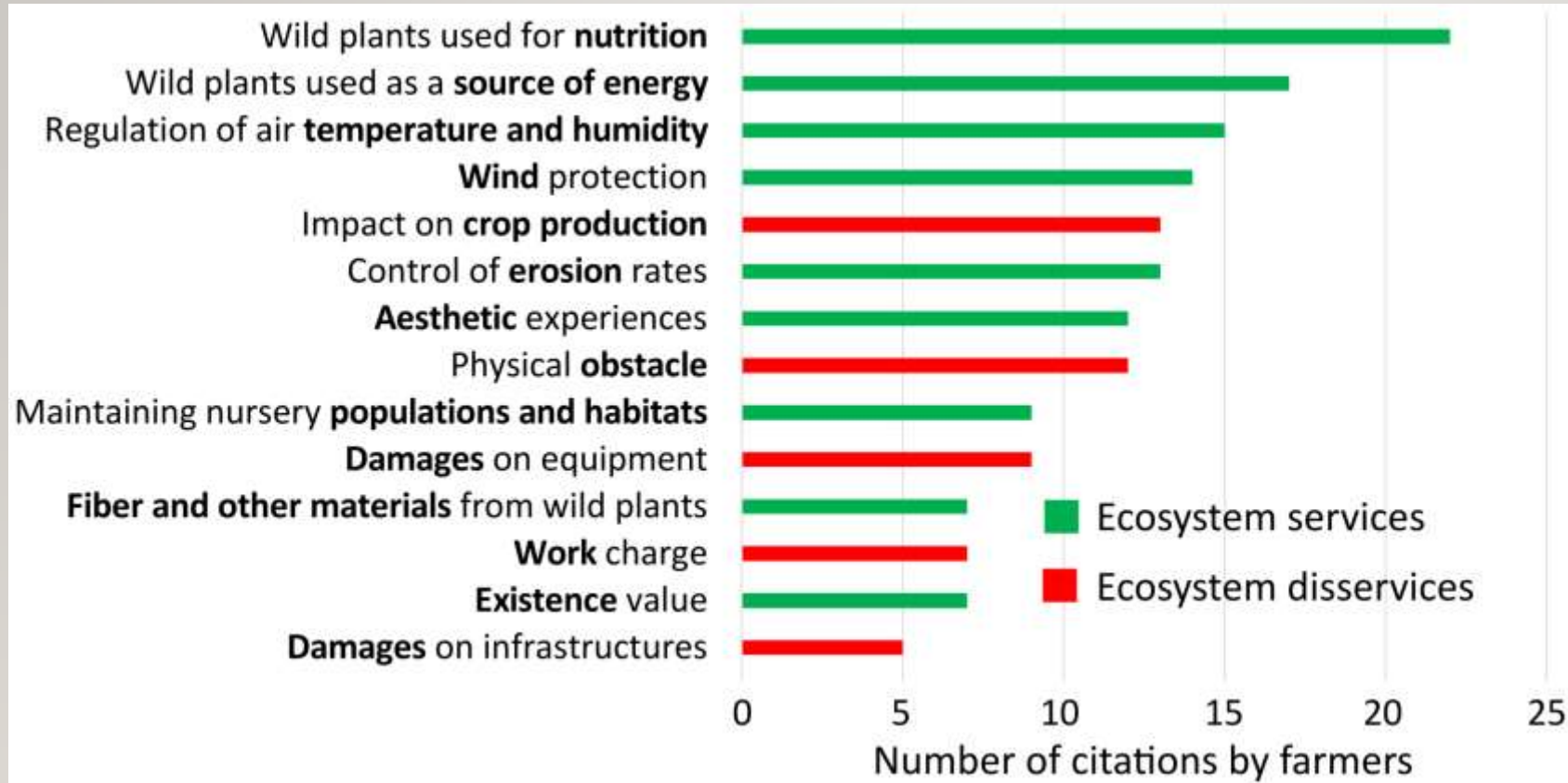
<https://pygar.omp.eu/>



Social drivers of rural forest dynamics: A multi-scale approach combining ethnography, geomatic and mental model analysis

Julien Blanco^{*,*}, Anne Sourdri^l, Marc Deconchat^{*,}, Sylvie Ladet^{*,}, Emilie Andrieu^{*,}

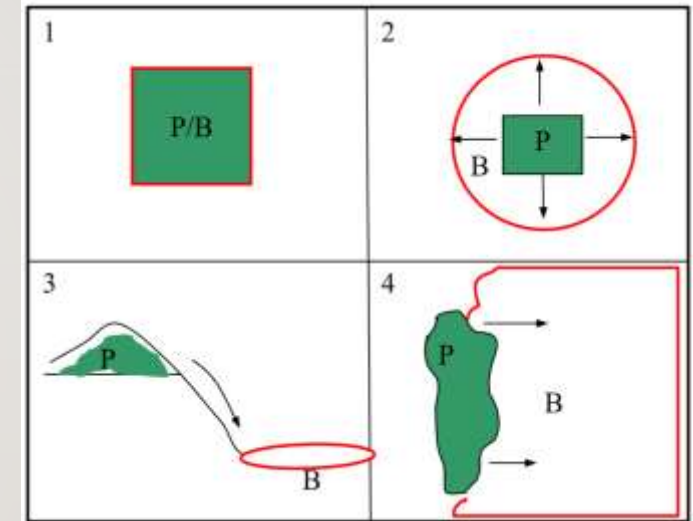
Which ecosystem (dis)services are listed by farmers?



Blanco, J., Sourdril, A., Deconchat, M., Barnaud, C., San Cristobal, M., & Andrieu, E. (2019). *Farmers compose with ecosystem services and disservices for managing on-farm trees: insights from a French case study*. Paper presented at the 4. World Congress of Agroforestry

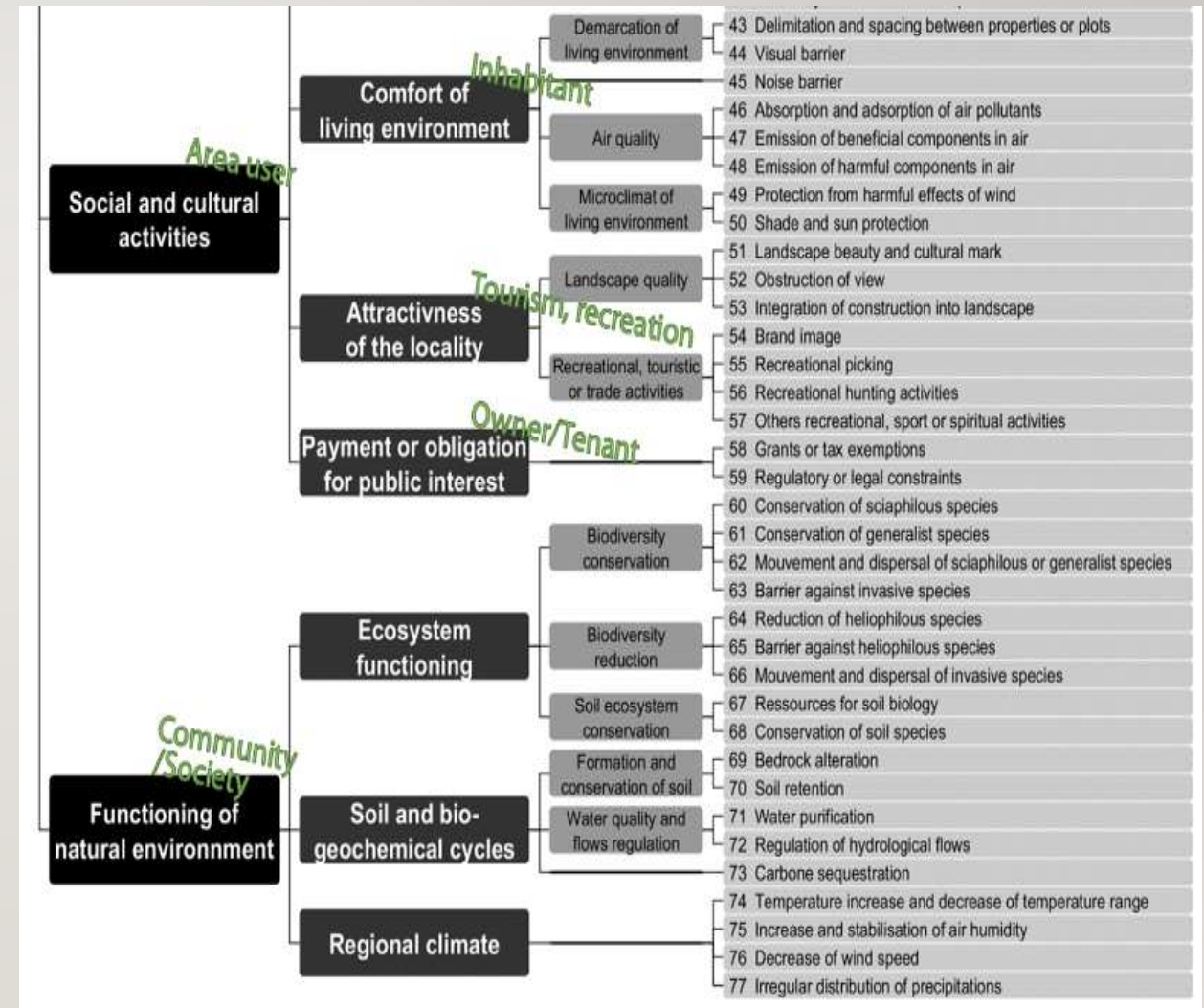
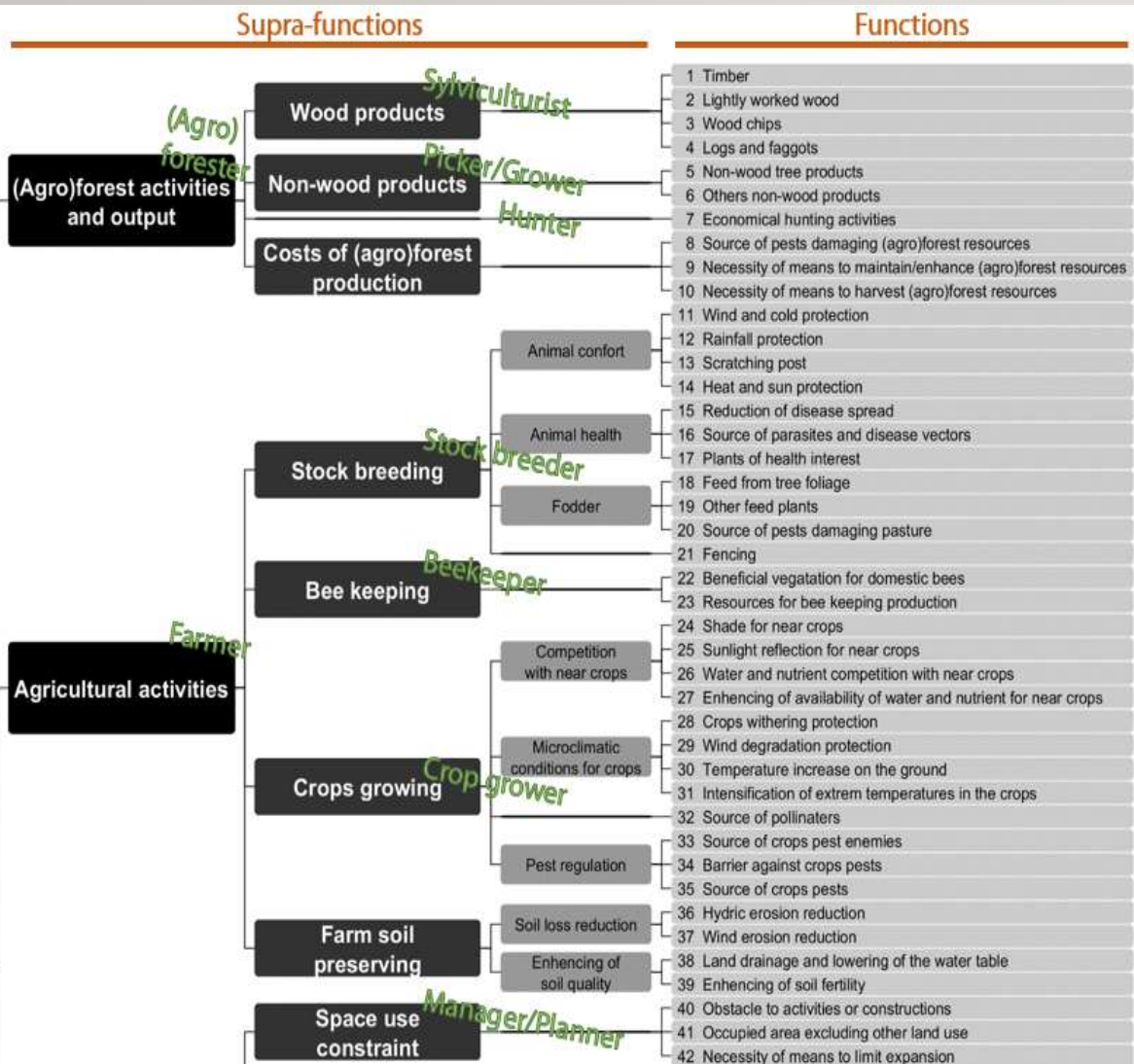
Which ecosystem (dis)services from a location point of view ?

<p>In situ services = services delivered within the forest patch</p>	<ul style="list-style-type: none"> • Biodiversity • Wood production • Wild food production • Biological invasion risk (<i>disservice</i>)
<p>Local-proximal services = services depending on the spatial proximity of the forest patch</p>	<ul style="list-style-type: none"> • Disturbance regulation • Habitat & refuge • Biological pest control • Pollination • Infectious diseases (<i>disservice</i>)
<p>Directional flow-related services = services extending from the forest patch to the point of use</p>	<ul style="list-style-type: none"> • Water regulation • Water supply • Erosion control • Carbon storage & climate regulation
<p>Global services = services independent from the forest patch location</p>	<ul style="list-style-type: none"> • Recreational activities • Aesthetics • Construction of local identity
<p>User movement-related services = services involving a movement of people towards the forest patches</p>	



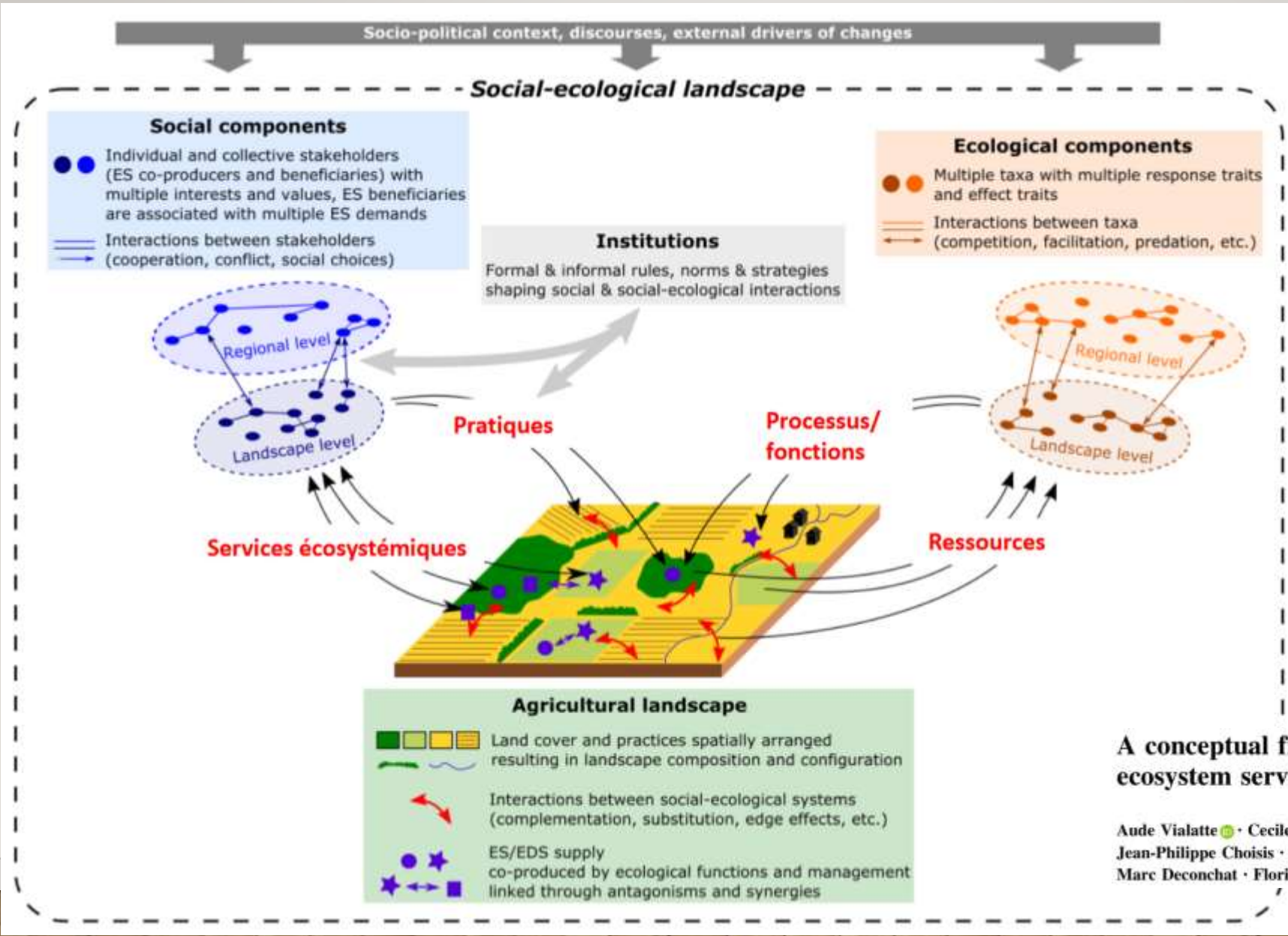
Decocq, G., Andrieu, E., Brunet, J., Chabrierie, O., De Frenne, P., De Smedt, P., Deconchat, M., Diekmann, M., Ehrmann, S., Giffard, B., Mifsud, E.G., Hansen, K., Hermy, M., Kolb, A., Lenoir, J., Liira, J., Moldan, F., Prokofieva, I., Rosenqvist, L., Varela, E., Valdés, A., Verheyen, K., Wulf, M., **2016. Ecosystem Services from Small Forest Patches in Agricultural Landscapes. Current Forestry Reports 2, 30-44.**

Which ecosystem (dis)services can we imagine?



Terafor: DEXI-based multicriteria model to consider all multiple fonctions of tree formations in temperate agroforestry area

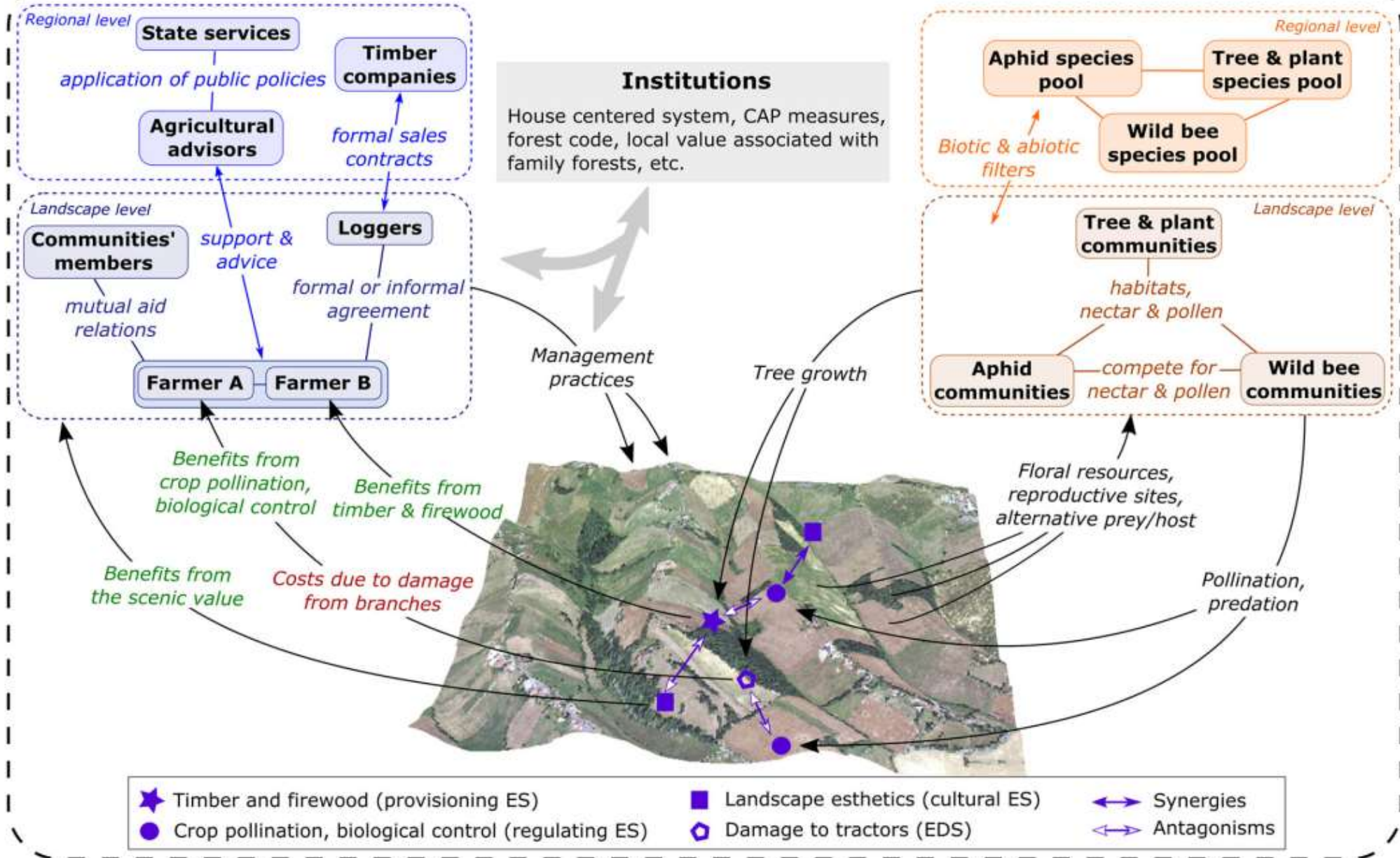
A more general framework



A conceptual framework for the governance of multiple ecosystem services in agricultural landscapes

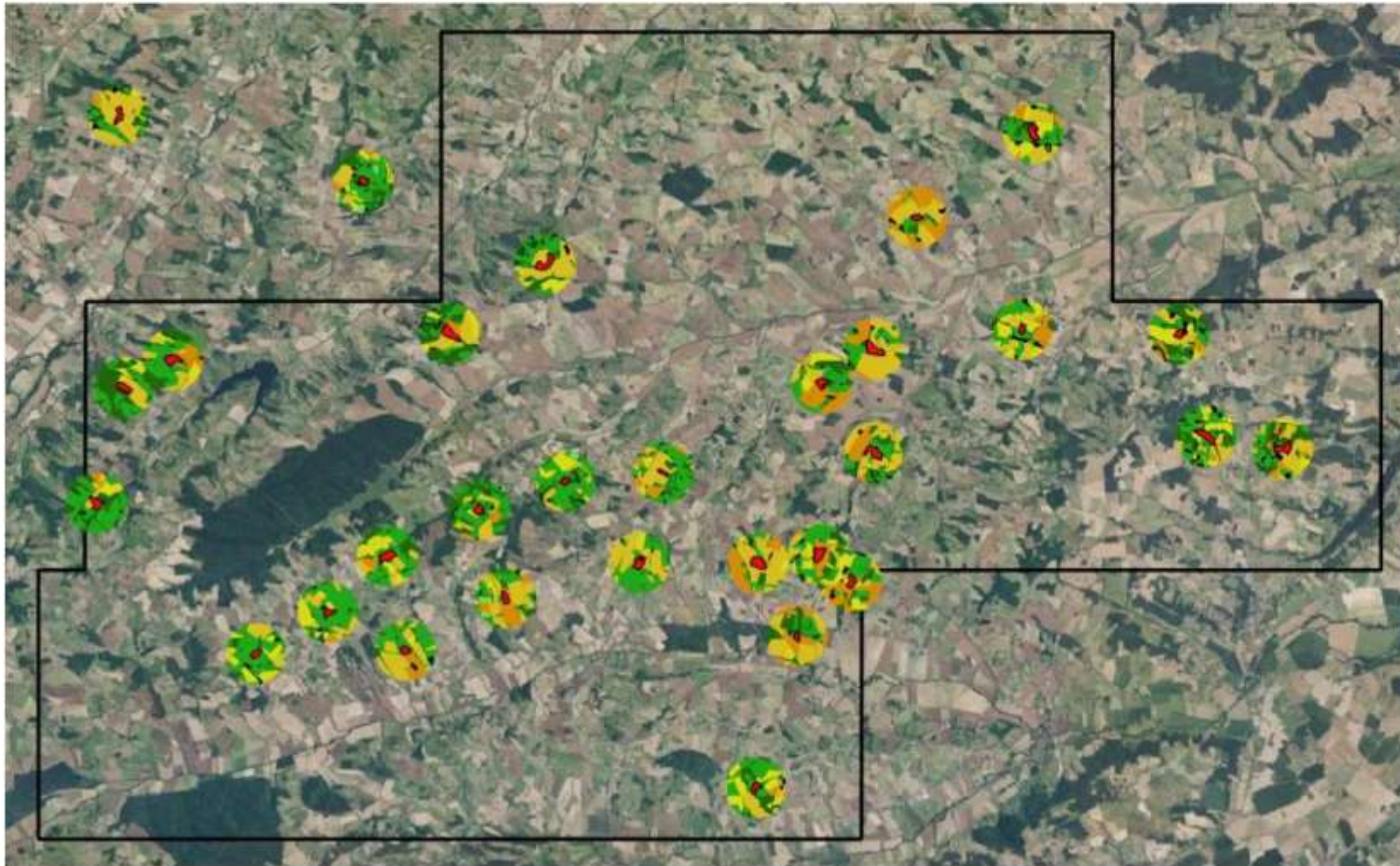
Aude Vialatte · Cecile Barnaud · Julien Blanco · Annie Ouin · Jean-Philippe Choisis · Emilie Andrieu · David Sheeren · Sylvie Ladet · Marc Deconchat · Floriane Clément · Diane Esquerré · Clélia Sirami

The social-ecological landscape of 'Vallées et Coteaux de Gascogne'

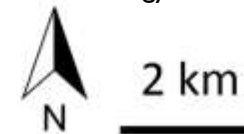


How to map ecosystems services related to small forests?

- > 28 woodlands were sampled in Coteaux de Gascogne / Toulouse
- > Hyperspectral images were acquired for the study zone

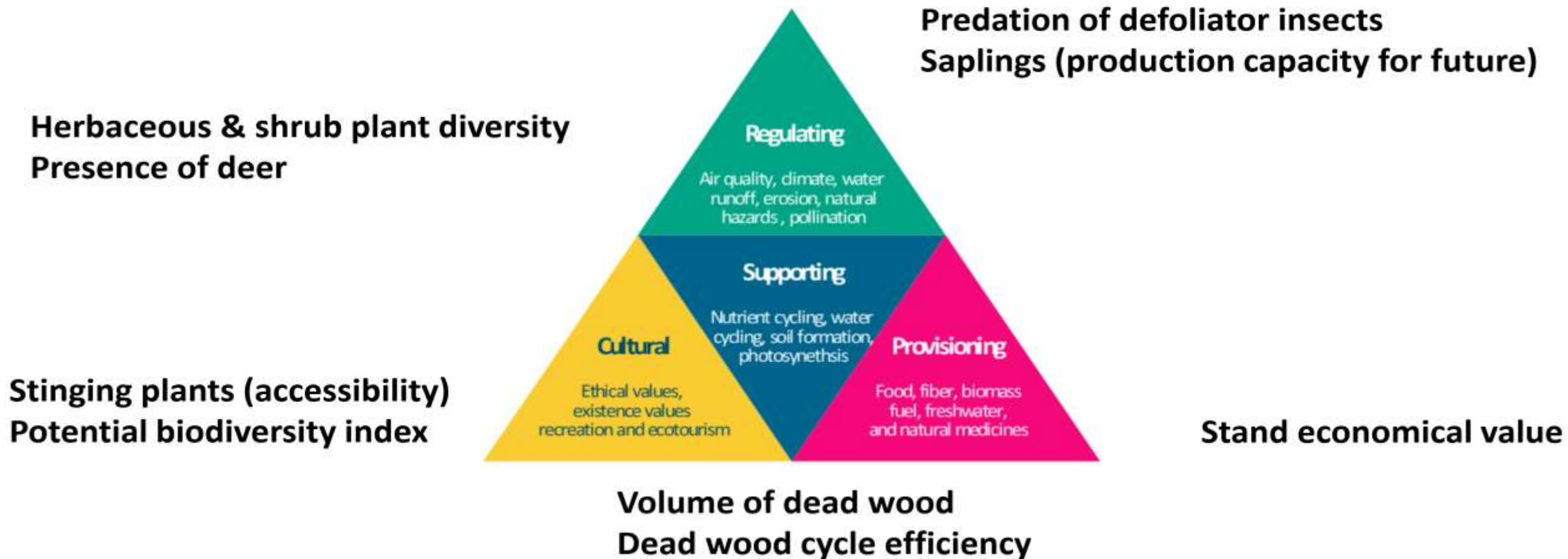


Duflot, R. ; San Cristobal, M. ; Fauvel, M. ; Vialatte, A.
Understanding the complex relationships between
landscape structure and various ecosystem services of
agricultural woodlands IUFRO 8.01.02 Landscape
Ecology Conference 2017



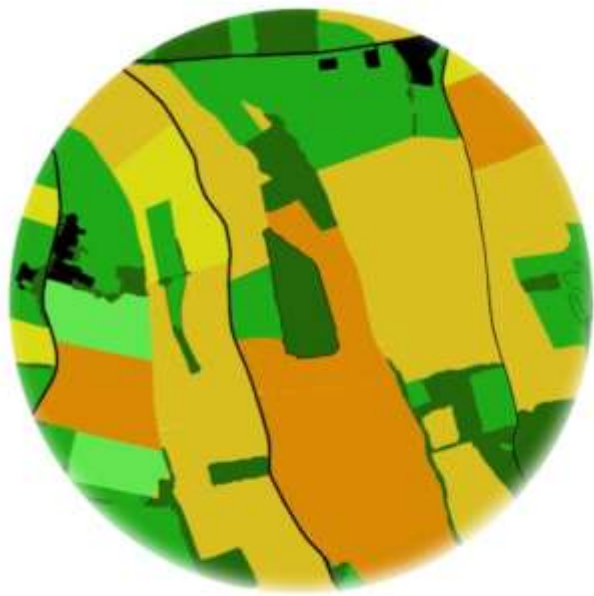
Which ecosystem (dis)services can we measure?

> 19 measure of services using standard protocols



Spatial data: land cover not always the best descriptor

- New data: high spatial, spectral and temporal resolution
- New methods for highly multidimensional data



Land-cover



NDVI

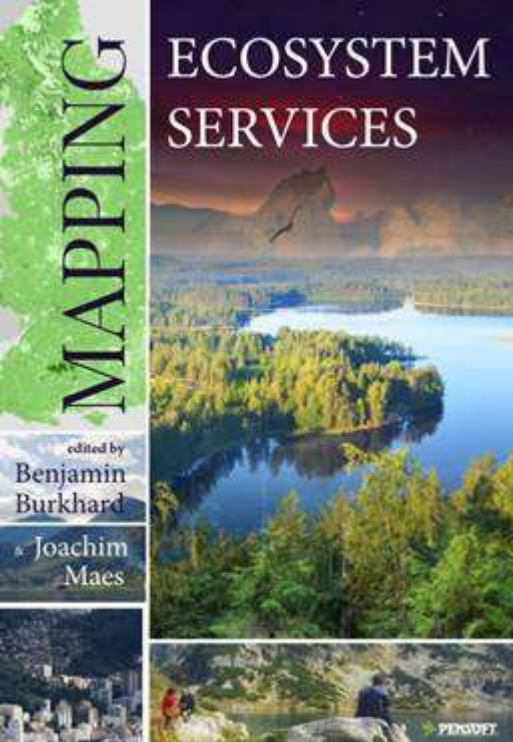
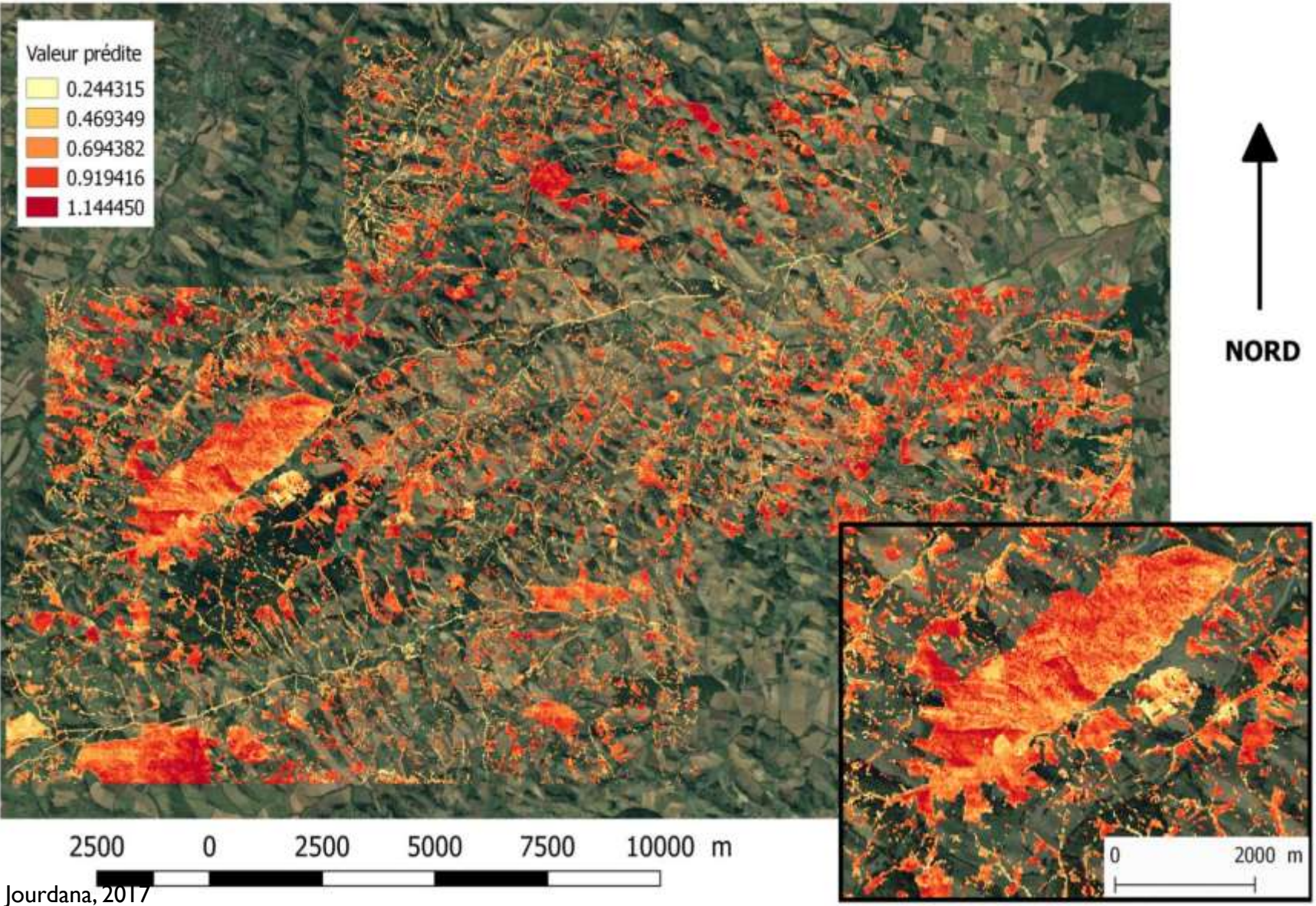


NDWI



VARIre

Map of potential impact of roe deer browsing on forest vegetation



Conclusion: small but important,
consider small forests
for ecosystem services with adequate methods !

