



# Linking fission-fusion dynamics to social complexity in a large-brained songbird

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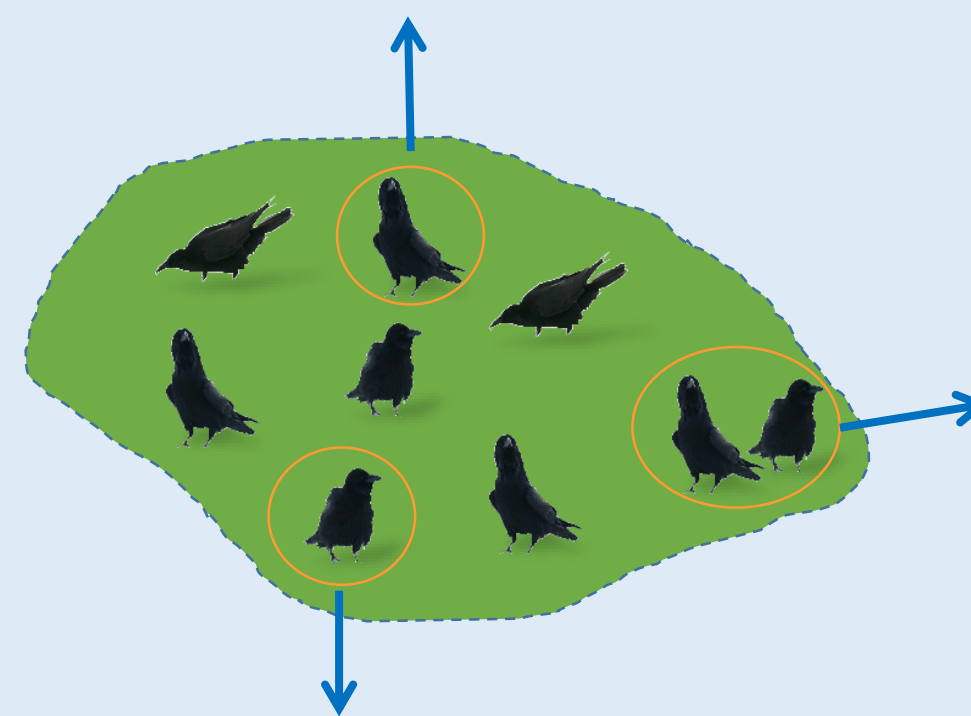


## Background

The development of socio-cognitive skills depends on dealing with social relationships, which in turn require repeated encounters/interactions between individuals. How does this work in groups with a high degree of fission-fusion dynamics?

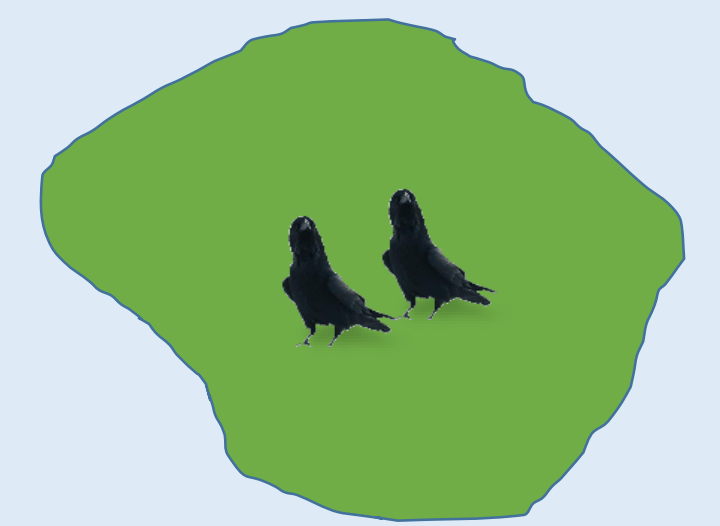
### Non-breeding ravens

- Form groups at food sources and roosts
- High degree of **fission-fusion dynamics**



### Breeding ravens

- Long-term monogamous
- Highly territorial year round



**Do non-breeding ravens meet each other repeatedly?**

## Methods

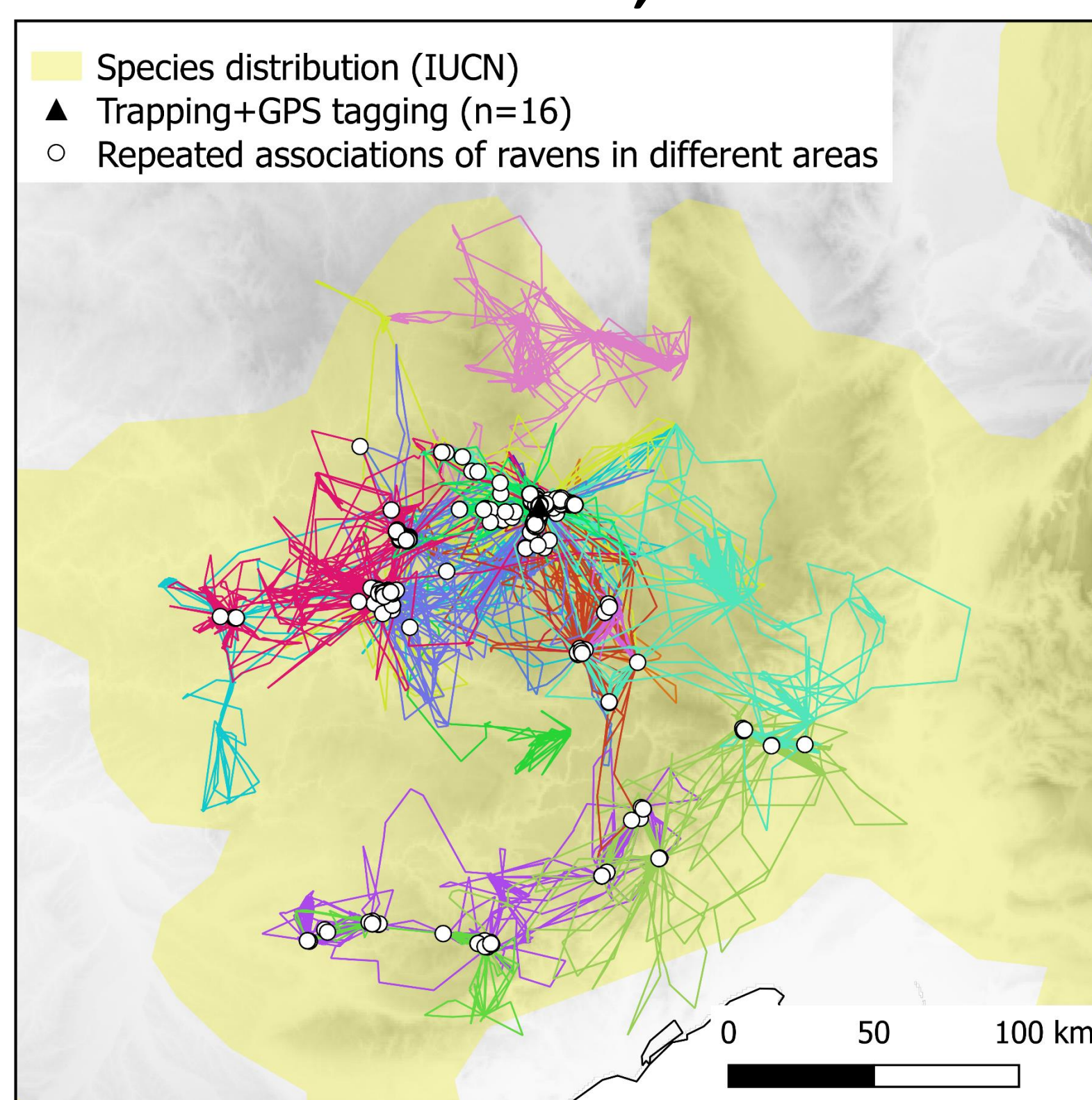
- GPS tracking of non-breeding ravens in two study areas during up to 4 years + identifying repeated associations
- Analysing association patterns of 186 individually marked ravens at a permanent food source in Austria during 4.5 years



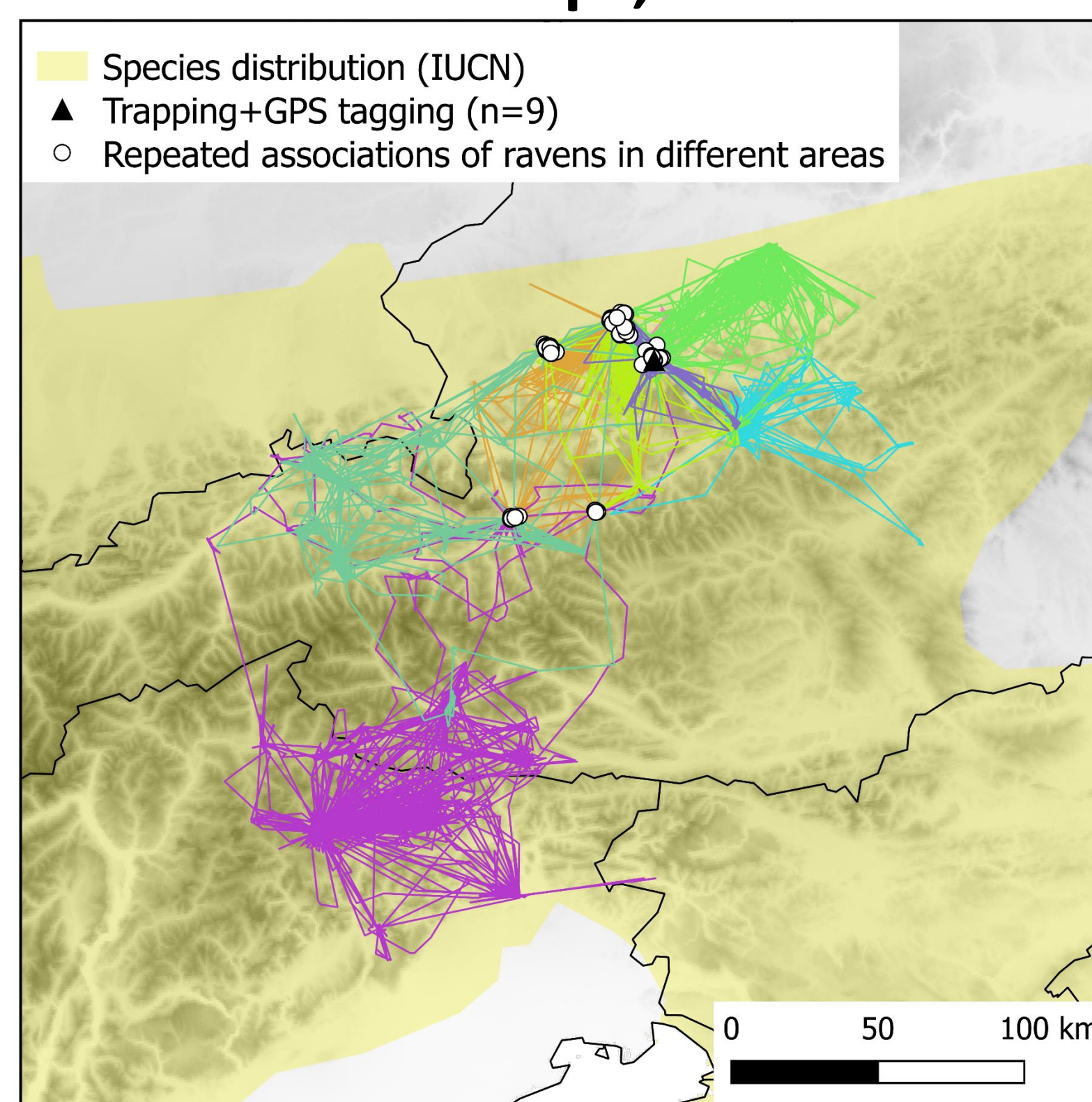
### 1. GPS tracking of non-breeding ravens during up to 44 months



#### Massif Central, France

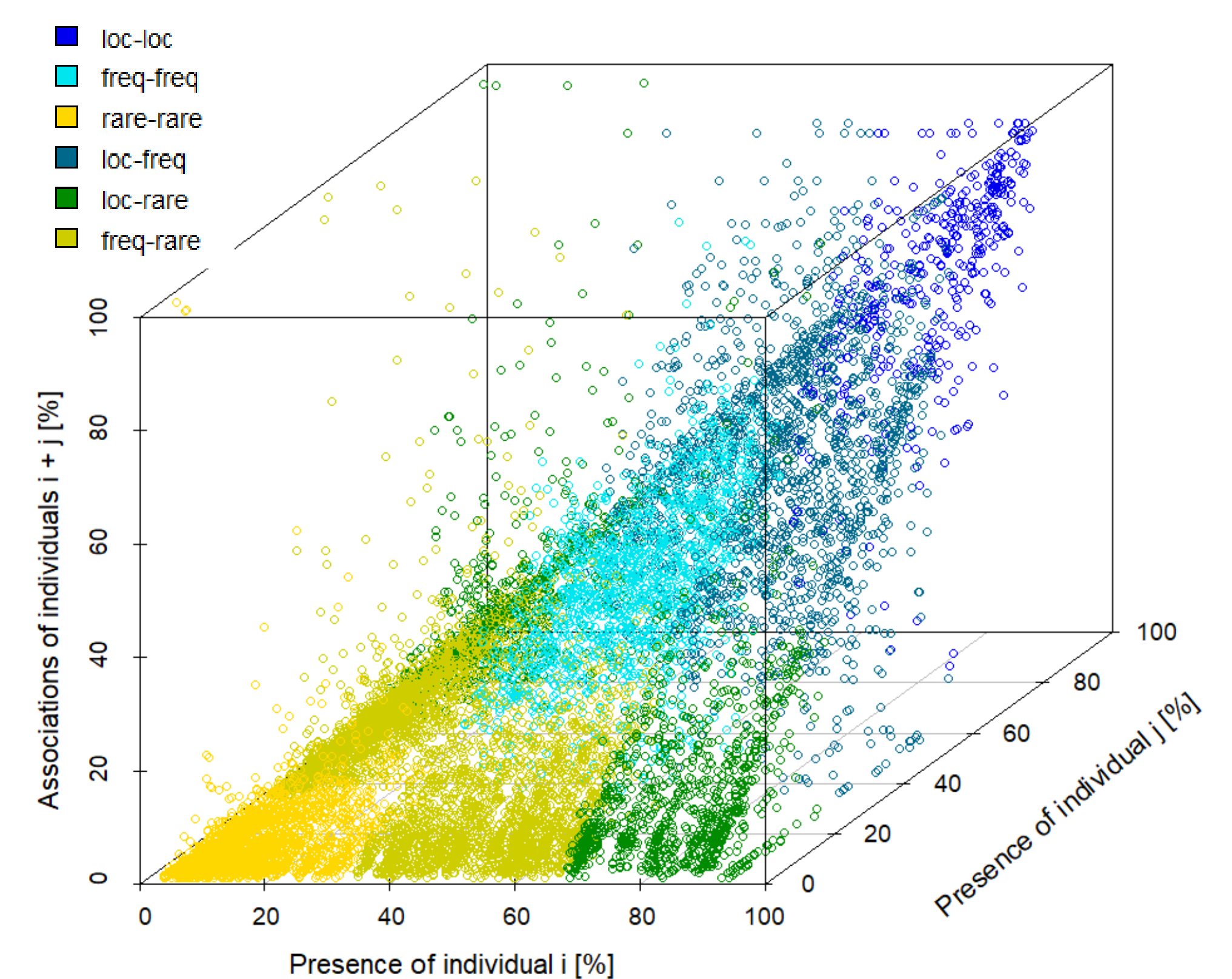


#### Eastern Alps, Austria



Coloured lines represent the movements of different non-breeding ravens. White circles indicate locations where 2 GPS-tagged ravens met within short distance, mostly at rich food sources or night roosts.

### 2. Association patterns of 186 ravens at a permanent food source



Large individual variation in the use of a food source; ravens are classified as locals (loc), frequent visitors (freq) and rare visitors (rare).

## Conclusion

- Non-breeding ravens show a large variation in the degree of fission-fusion dynamics.
- Individuals meet repeatedly at the same or different locations.

Such a system with repeated associations/interactions between non-breeding ravens offers the opportunity to develop social relationships and socio-cognitive skills!



- Some dyads of ravens (locals) associate and likely interact almost daily over long time periods
- Sex or genetic relationship did not influence presence or association patterns!

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