

# Maxime Lambinet

**Project manager for  
MigFoRest, deploying assisted  
migration**

at **Royal Forestry Society of  
Belgium (SRFB)**



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MigFoRest

# MigFoRest international conference

Brussels, 14 April 2026

Complex Functional Networks and Regional Adaptation :  
Linking Field Data and Ecosystem Modelling

**Maxime Lambinet**, Project Manager at SRFB

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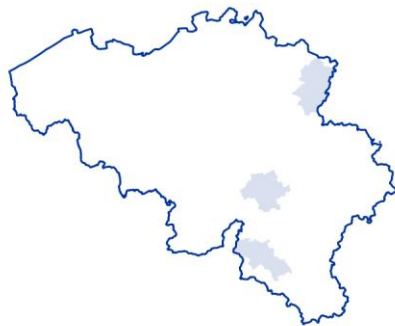
Wallonie

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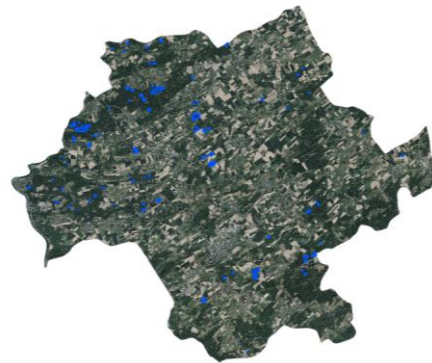
# MigFoRest objectives

Deployment of assisted migration, through the **plantation of 100,000 trees**  
**Forest enrichment** to increase genetic **diversity, gene flow** and **resilience**

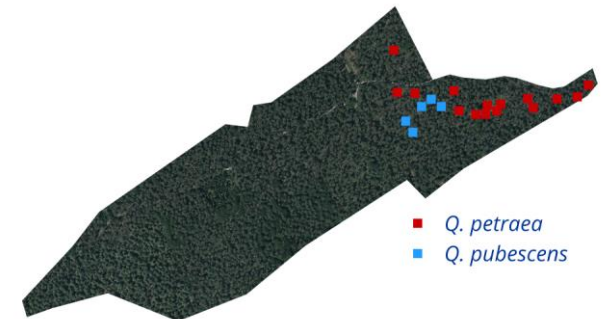
Introduce the trees in the most optimal way to **ensure their dispersal**  
(pollen and seed) within the landscape



Pilot territories



Candidate sites

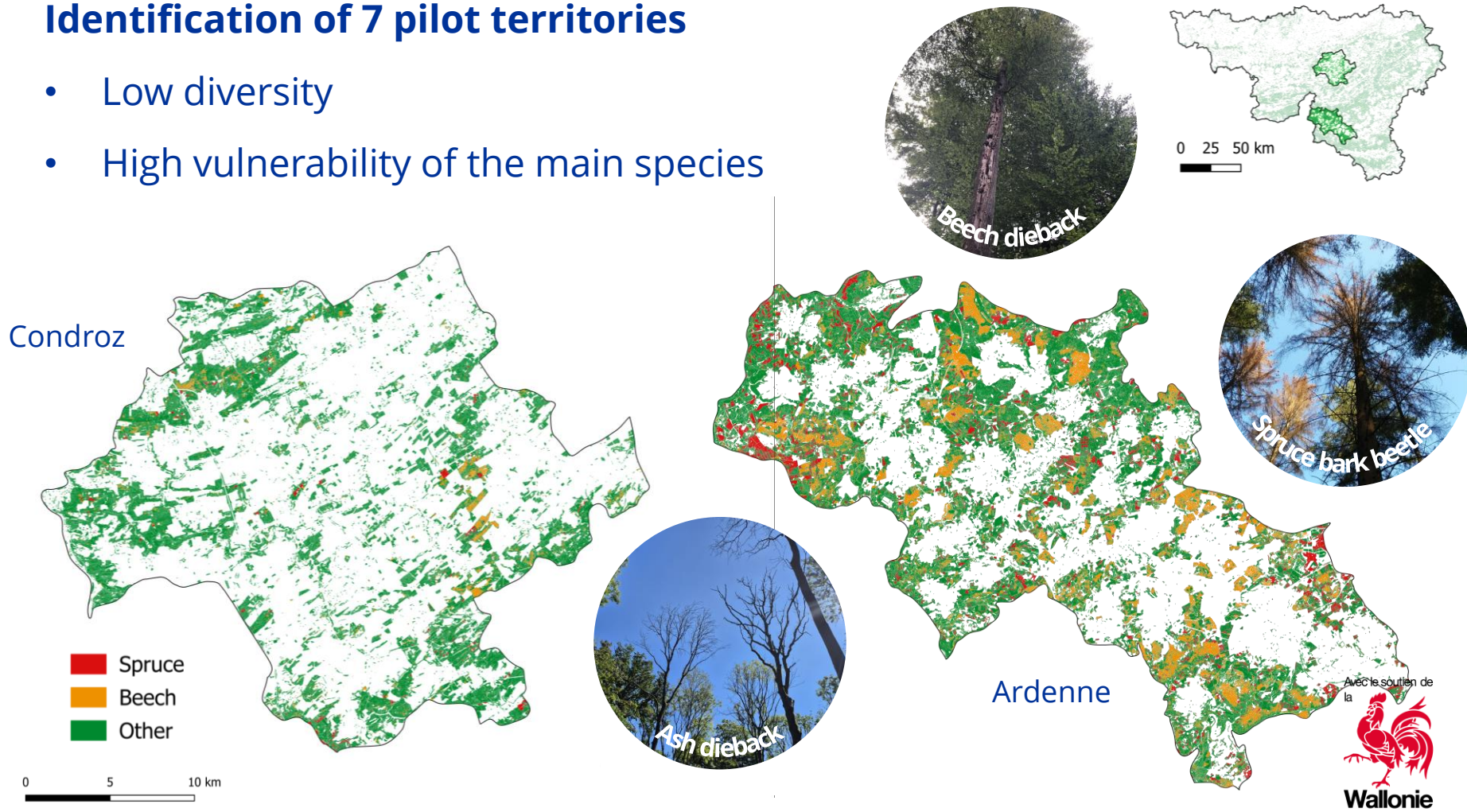


Planting locations

# Pilot territories

## Identification of 7 pilot territories

- Low diversity
- High vulnerability of the main species



# Pilot territories

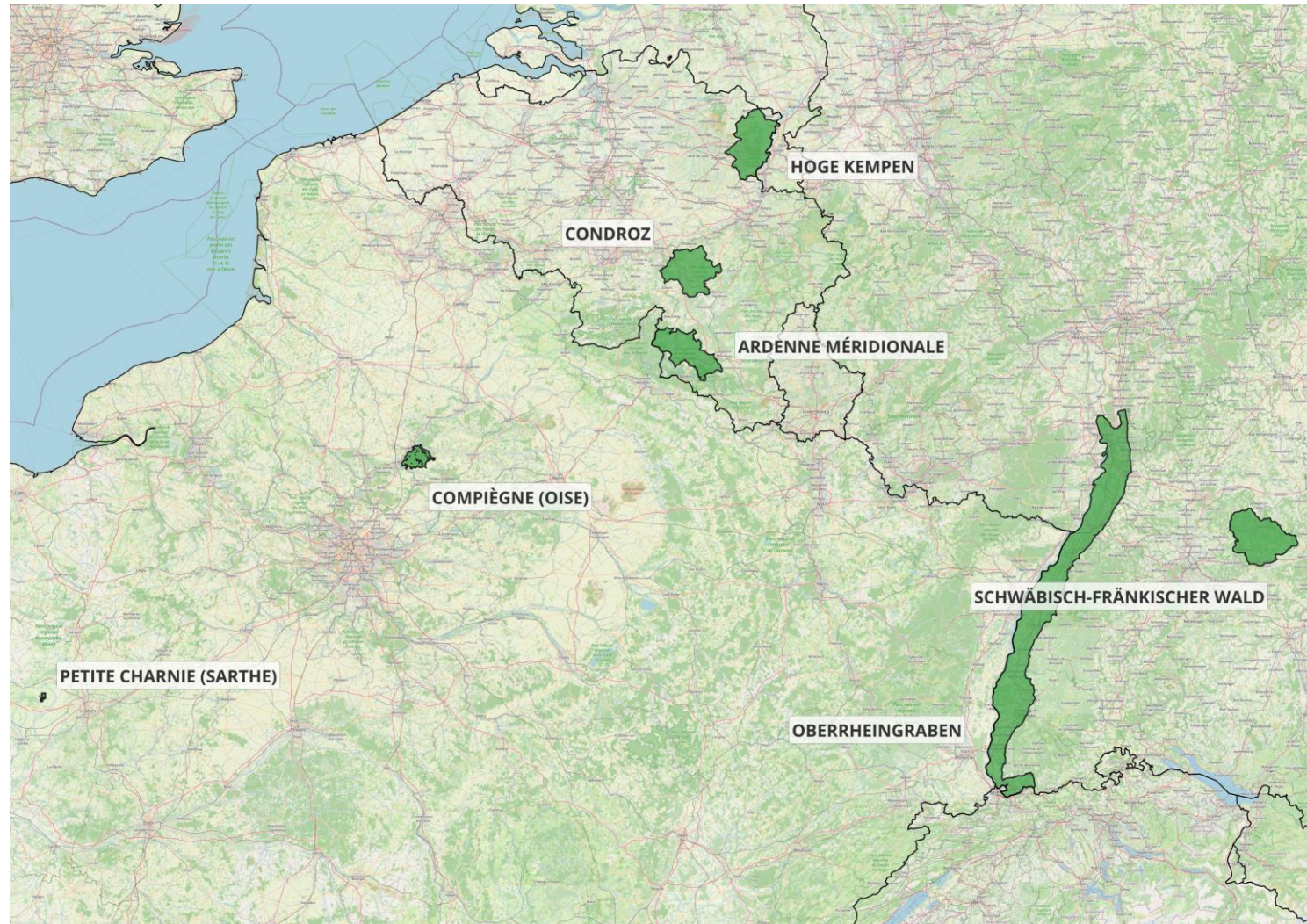
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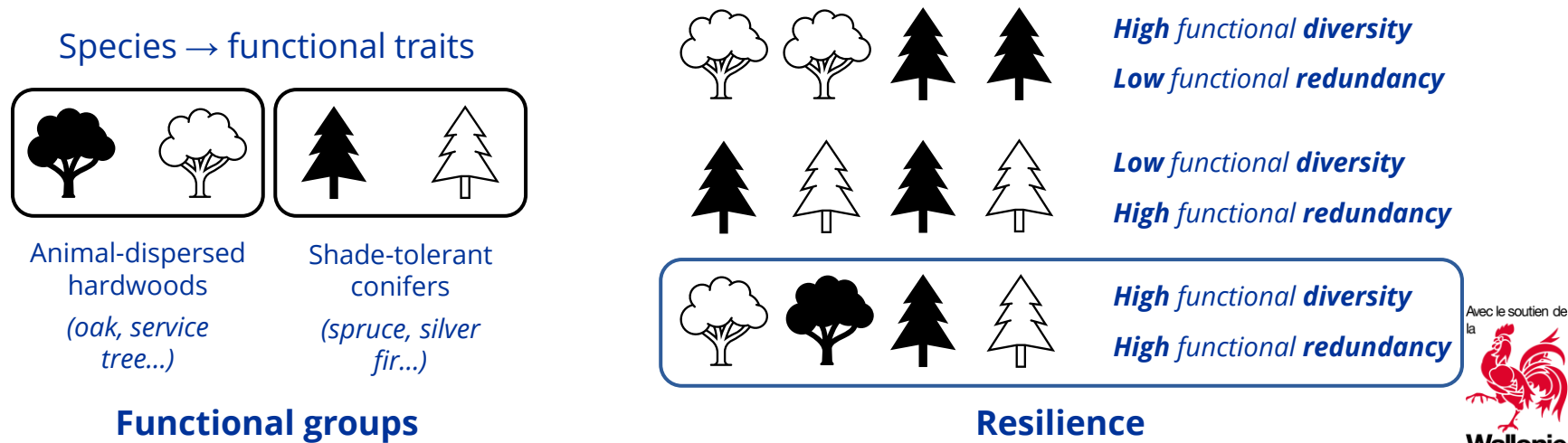
# FCN approach

## Selection of candidate planting sites (plots)

### The **Functional Complex Network (FCN)** approach

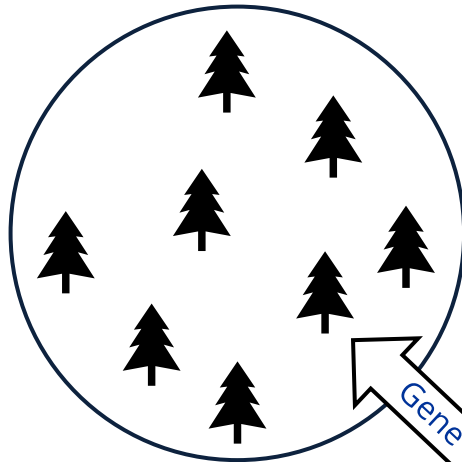
*Messier et al, 2019*

Improving the **resilience** of forests to disturbances by increasing the **functional diversity and redundancy** of trees and by targeting the **introduction of species** to the most appropriate locations in the landscape to **ensure their dispersal**

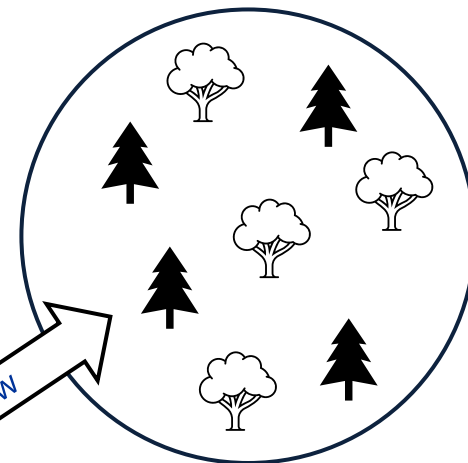


# FCN approach

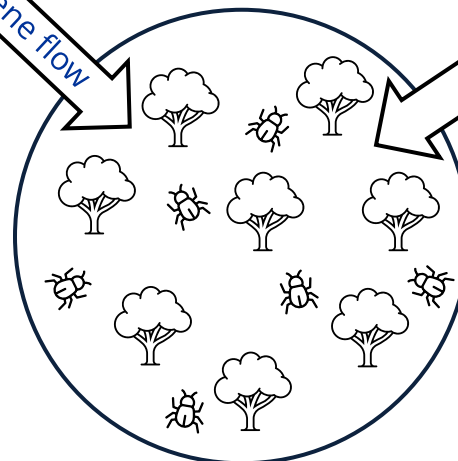
*Low functional diversity*  
*Low functional redundancy*  
*Low connectivity*



*High functional diversity*  
*Low functional redundancy*  
*Low connectivity*



*Low functional diversity*  
*Low functional redundancy*  
*High connectivity*

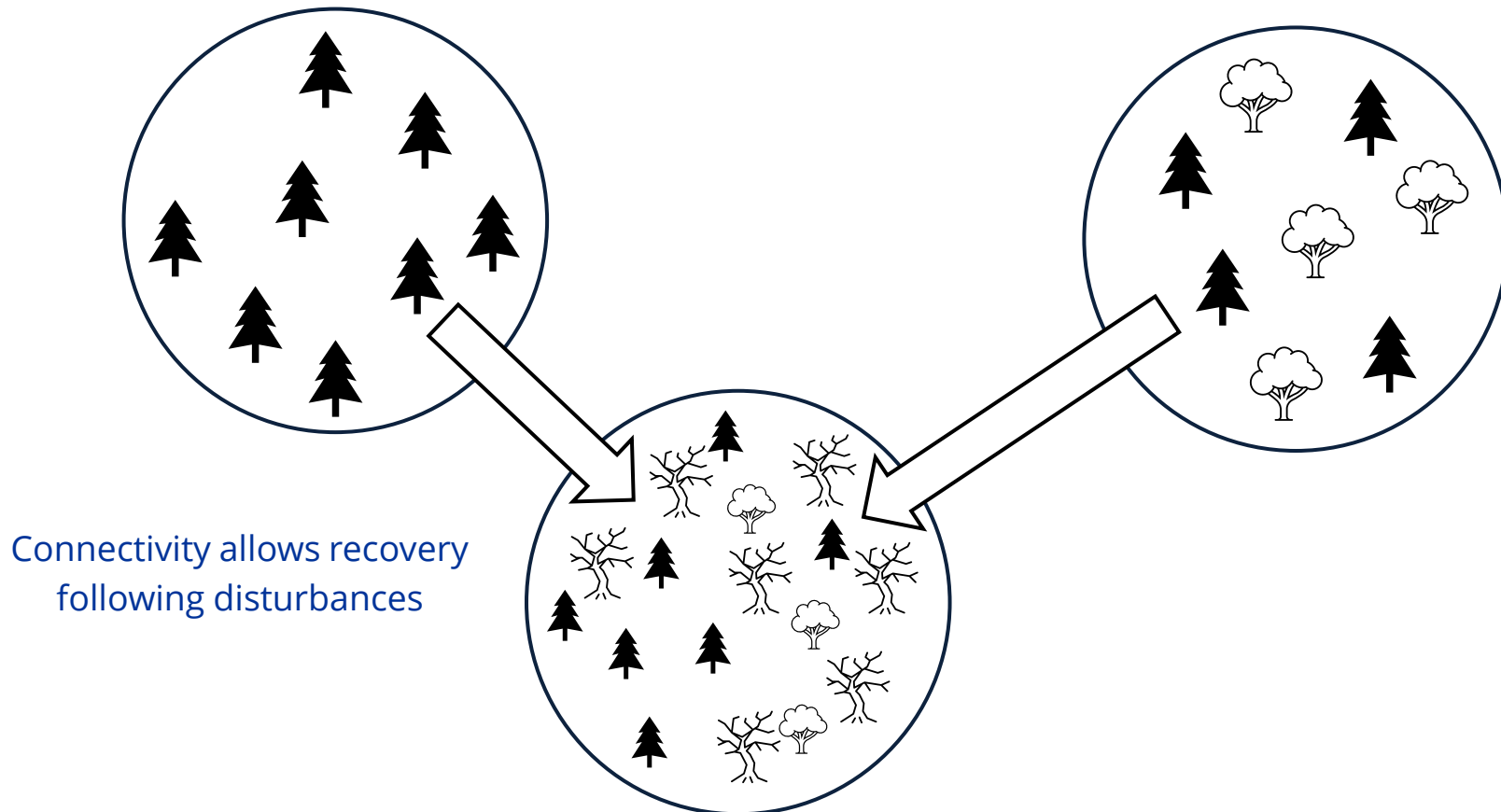


Gene flow

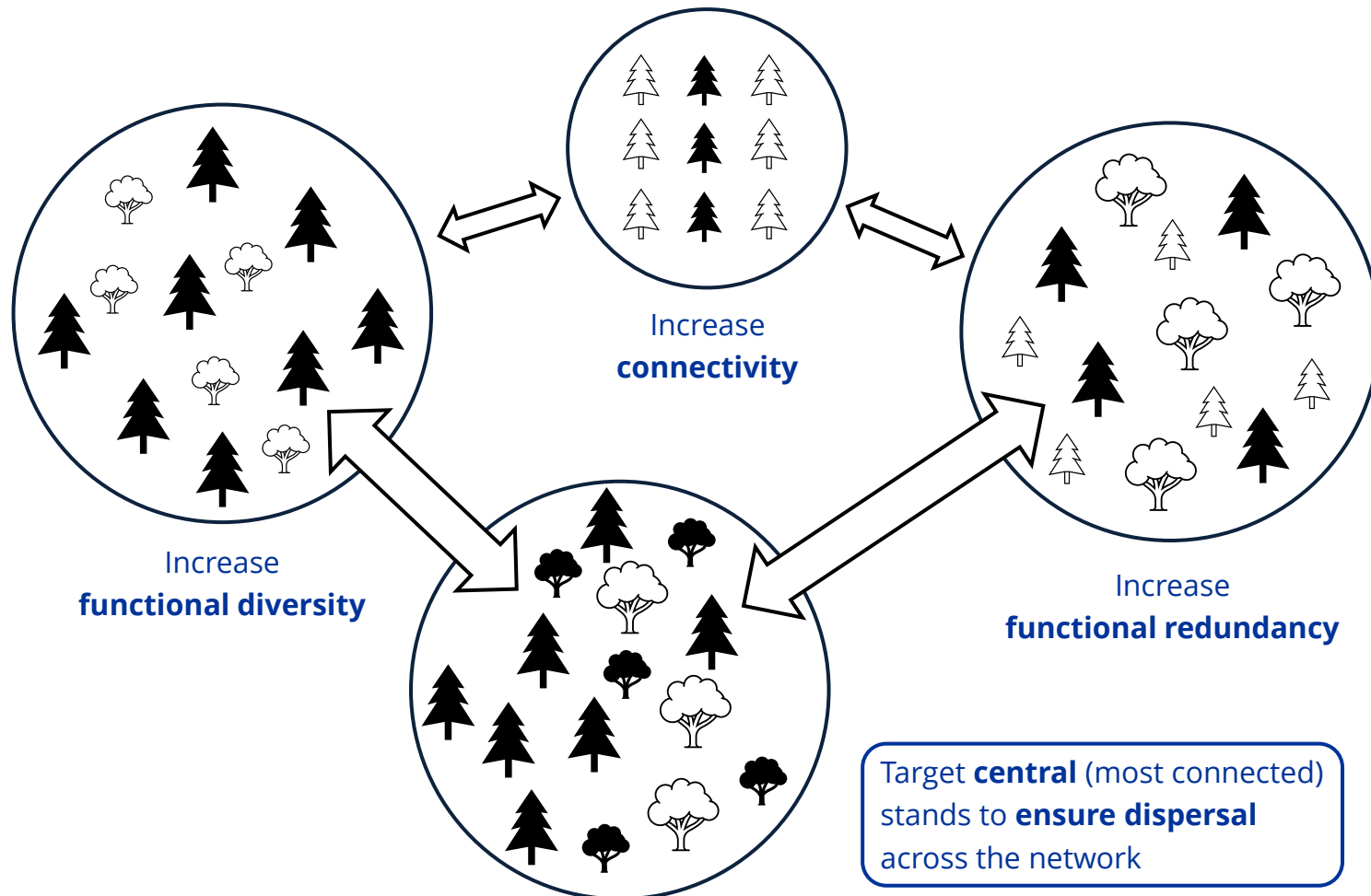
Gene flow

Set of **forest patches** characterized by their (functional) **composition** and **connectivity** (seed and pollen dispersal)

# FCN approach



# FCN approach



# MigForest approach

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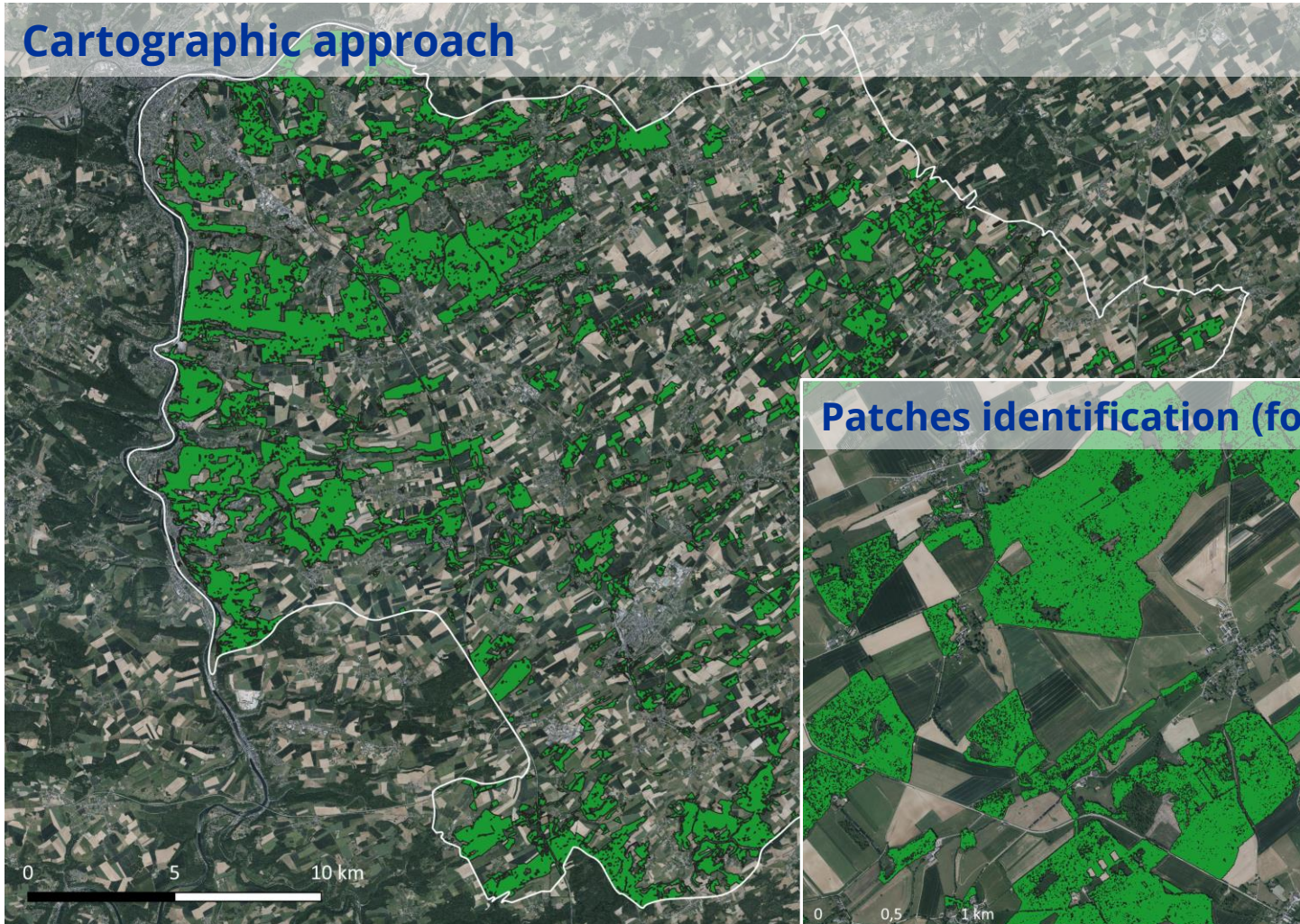


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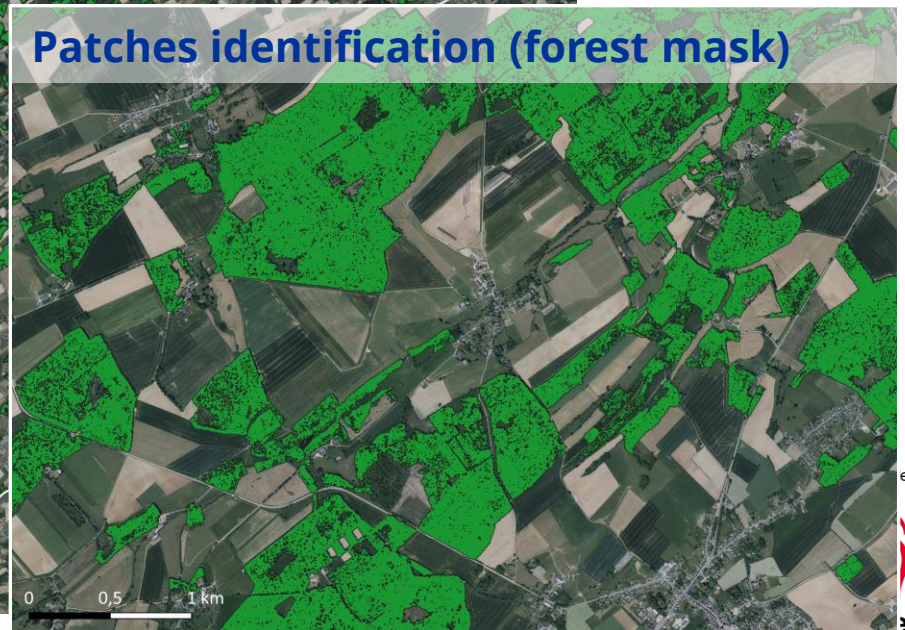
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Cartographic approach



Patches identification (forest mask)



# MigForest approach

## Cartographic approach

Planting sites selection criteria



Low functional diversity



High species vulnerability



High connectivity

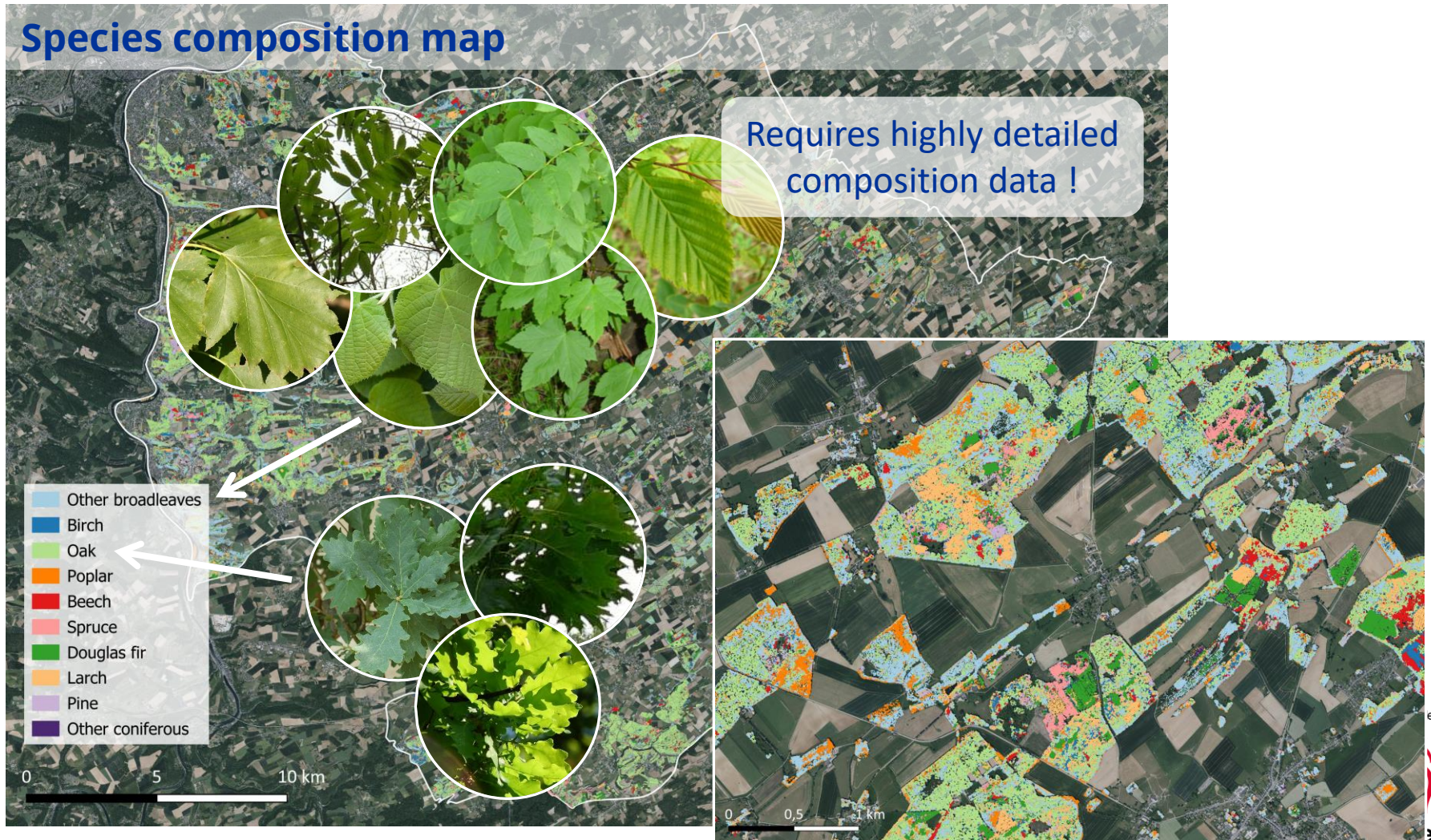
0 5 10 km

## Automatic splitting (500 x 500 m grid)

0 0,5 1 km

# MigForest approach

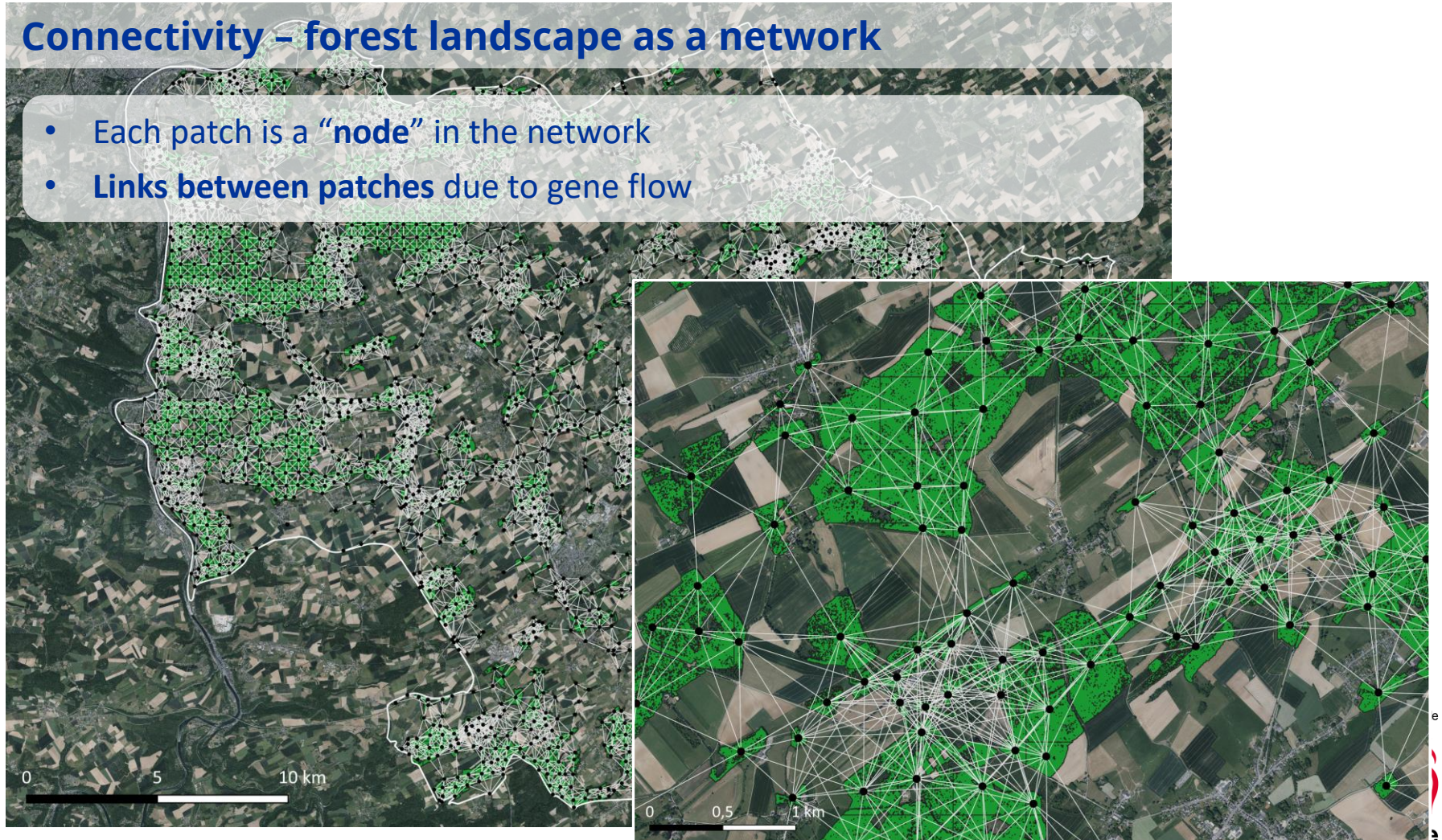
## Species composition map



# MigForest approach

## Connectivity – forest landscape as a network

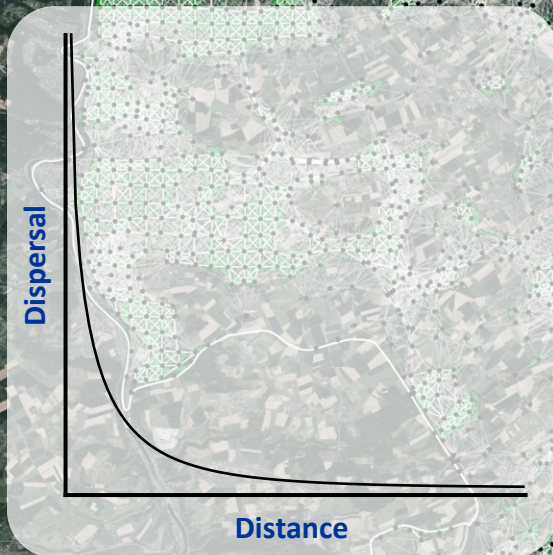
- Each patch is a “**node**” in the network
- **Links between patches** due to gene flow



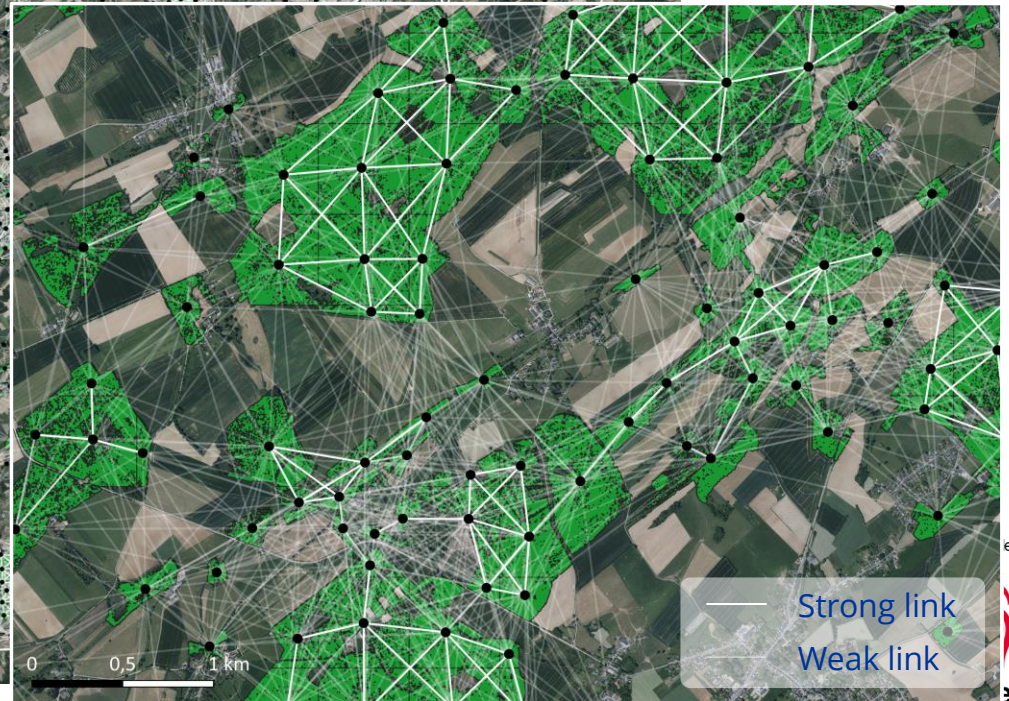
# MigForest approach

## Connectivity – trees dispersal

- Links weighted based on the species dispersion ability
- Decreasing exponential function of distance



0 5 10 km



Strong link  
Weak link

# MigForest approach

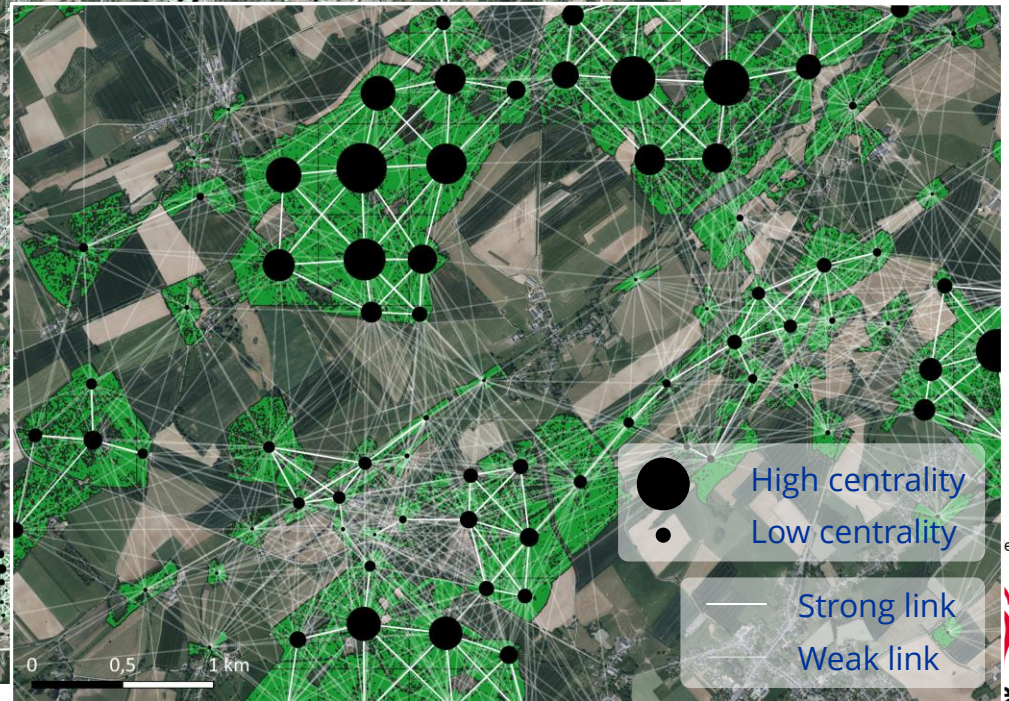
## Connectivity - central patches

- **Centrality index**
- Importance is given to **large patches strongly connected** to other large patches

$$C_i = A_i + \sum_{j=1}^n L_{ij} * A_j$$

**Central patches maximize dispersal of the introduced genes through the network**

0 5 10 km



# MigForest approach

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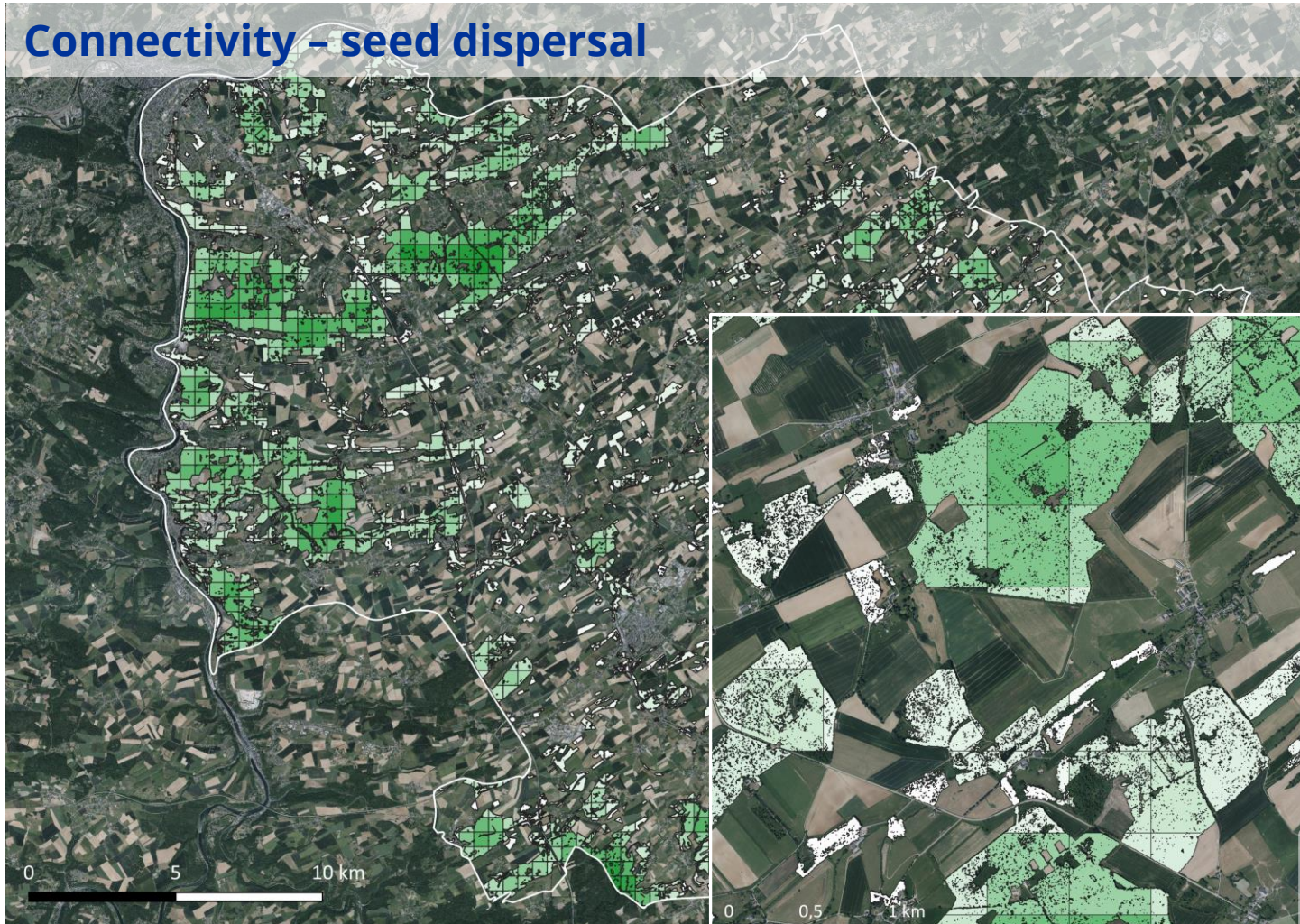


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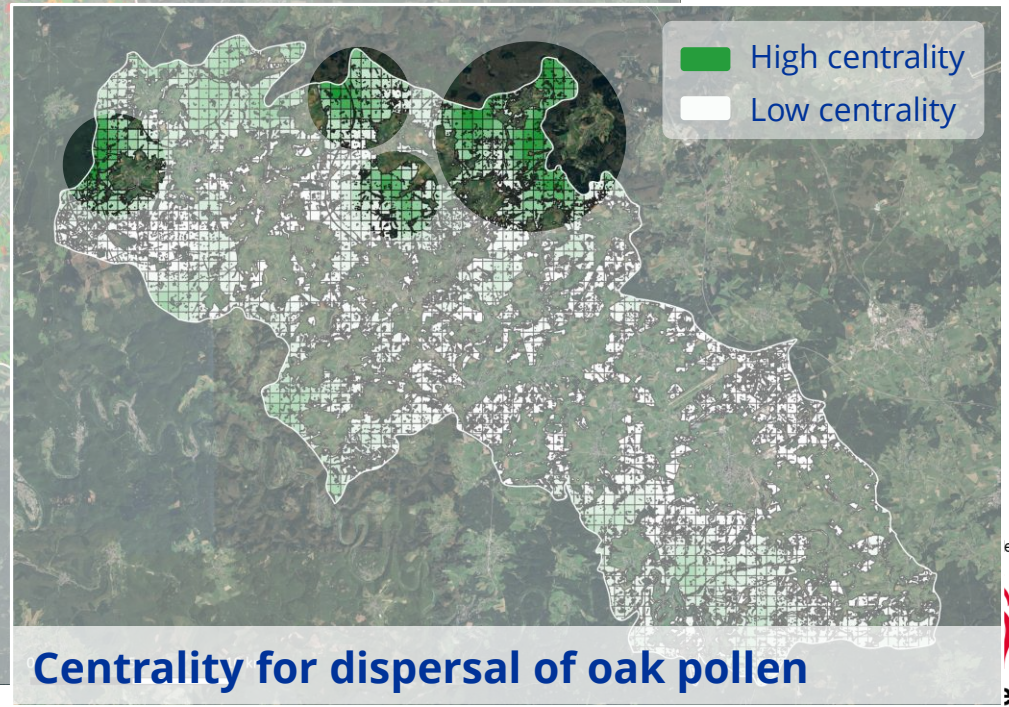
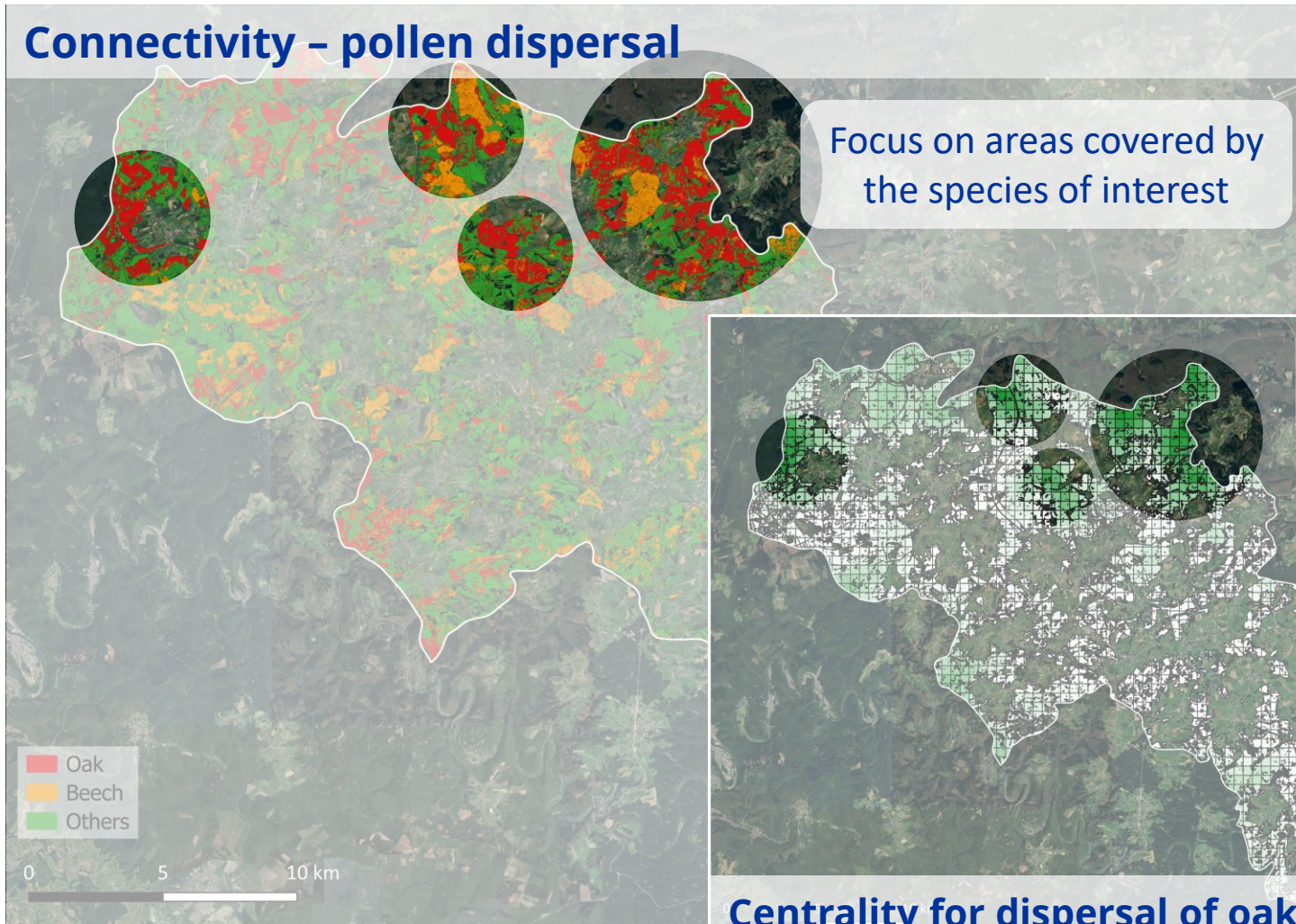
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## Connectivity - seed dispersal



# MigForest approach

## Connectivity - pollen dispersal



# MigFoRest approach

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- **Simplified** theoretical approach
- Analytical framework for **identifying priority areas**
- Makes use of **“basic” information**
- **Uncertainty** around seed and pollen dispersal  
→ planting location and density
- **Other key factors** for site selection
  - Light availability
  - Soil and climate conditions
  - Game pressure
  - Susceptible sites (Natura 2000, protected areas...)
  - Owner



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# Conclusion

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**FCN approach might help increase forest resilience** by identifying priority action areas at a landscape scale



**Further development needed** to derive practical management applications



**Requires detailed data** that is rarely available (forest composition)



Would benefit from a better understanding and **quantification of gene flow dynamics**

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**Thank you**

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