

BioSpace25 - Biodiversity insight from Space  
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# A framework for Monitoring, reporting and Verification of Biodiversity and Ecosystem Services (MRV-BES)

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+ SUPERB consortium



# Systemic solutions for **UP**scaling of urgent **E**cosystem **R**estoration for forest related **B**iodiversity and ecosystem services

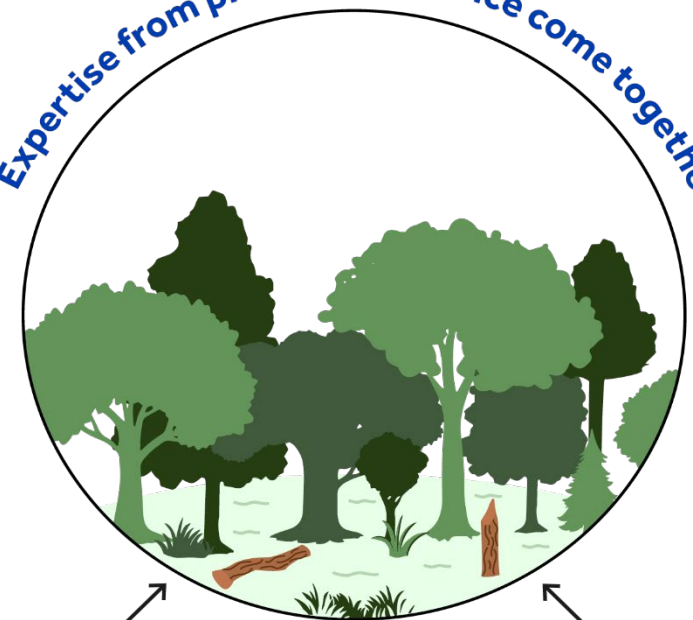


## SUPERB

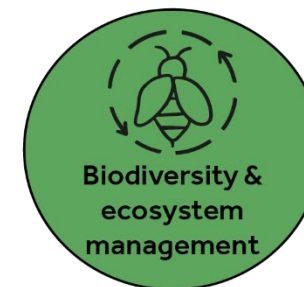
Upscaling Forest Restoration

SUPERB aims to **restore forest landscapes** across Europe by creating an enabling environment for the implementation of forward-looking forest restoration at different scales.

Expertise from practice & science come together



Governance & stakeholder engagement



Biodiversity & ecosystem management



Innovative finance

<b>Project scope</b>		<b>0.6M ha</b> completed or initiated restoration		
#UpscalingForestRestoration				
4 years (started in 12.2021)	36 Partners led by EFI	16 European countries	€20M EU funds	€90M External resources





# SUPERB

Upscaling Forest Restoration

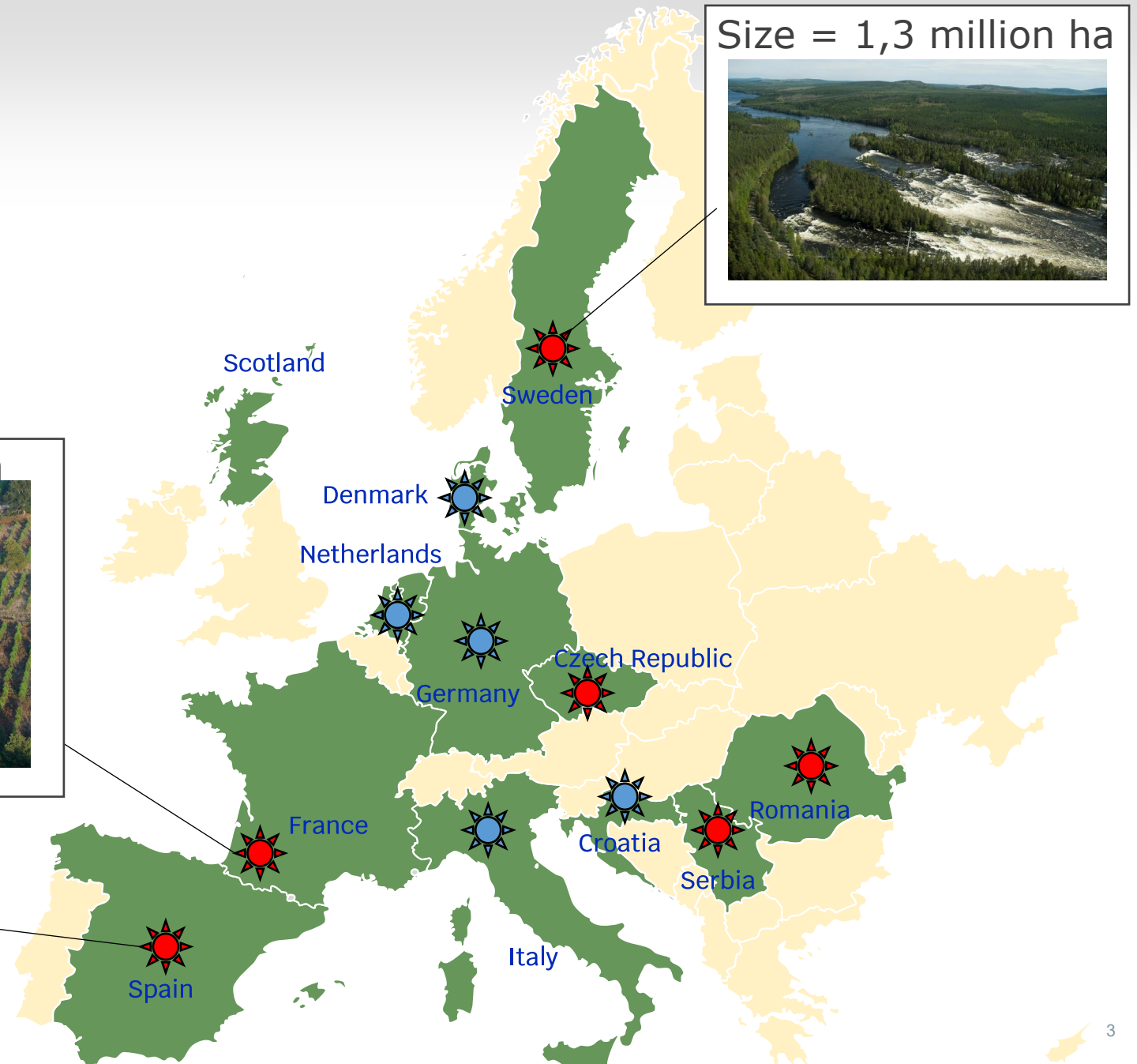
Size = 1,3 million ha



Size = 20,000 ha



Size = 205 ha



# Our restoration actions include:



Reforestation



Enhancing structural diversity



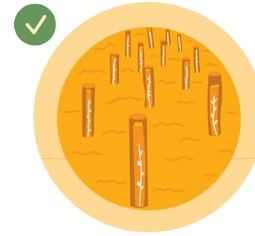
Enhancing forest connectivity



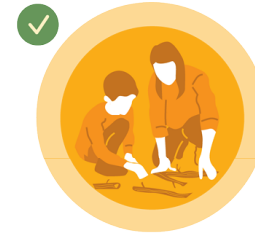
Promoting natural regeneration



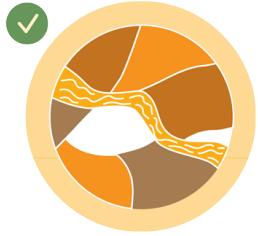
Protection of veteran trees/ old-growth patches



Afforestation



Forest education



Landscape diversification



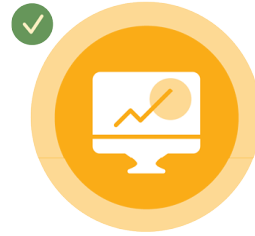
Underplanting



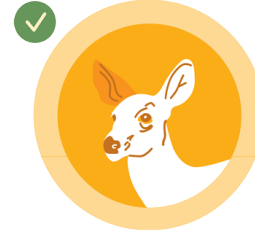
Forest diversity



Protecting regeneration



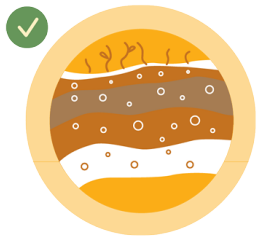
Advanced monitoring



Wildlife management



Adapting tree species composition to climate change



Soil vitalisation



Maintaining tree microhabitats



Stakeholder engagement



Hydrology restoration

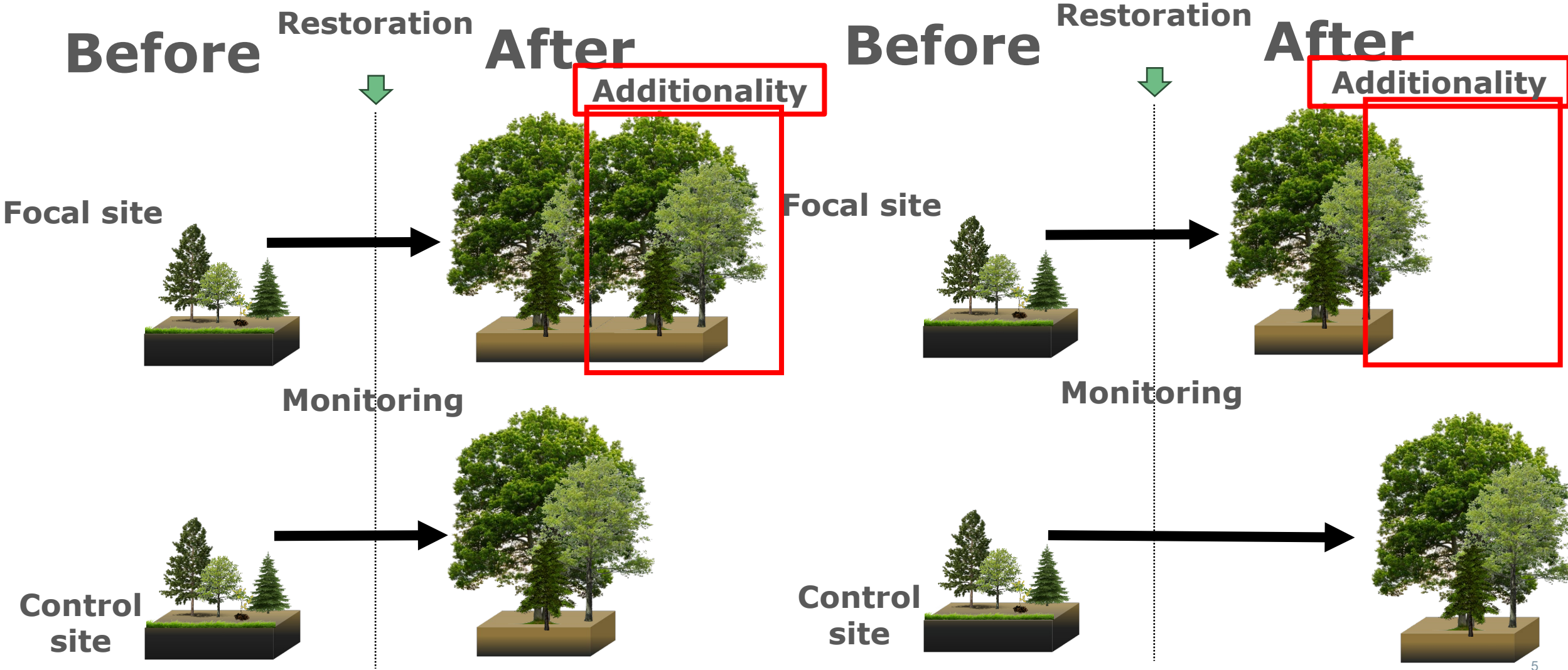


Increasing deadwood

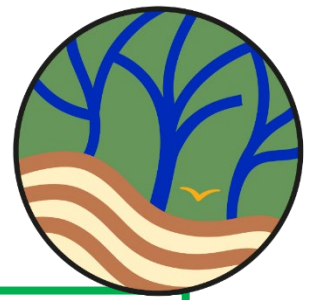


Habitat restoration for specific species

# Principle of Additionality



# Biodiversity Assessments

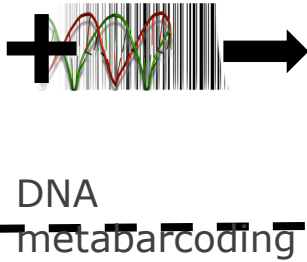


**SUPERB**  
Upscaling Forest Restoration

Detecting change in biodiversity as a response to restoration



Malaise trap



DNA metabarcoding



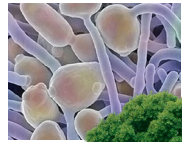
Flying arthropods



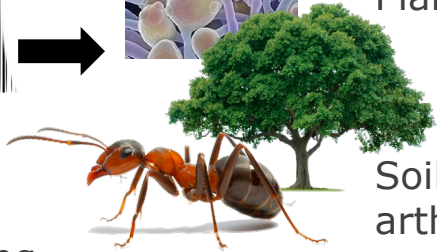
Soil sampling



DNA metabarcoding



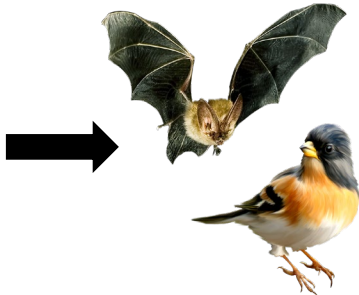
Soil Fungi  
Plants



Soil arthropods



Acoustic recorders



Bats  
Birds

+ Remote sensing



Multispectral sensor

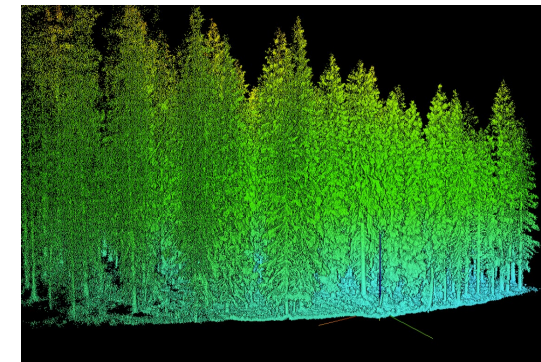


Airborne Laser scanner

- Coverage of forests
- Diversity of forest types
- Connectivity

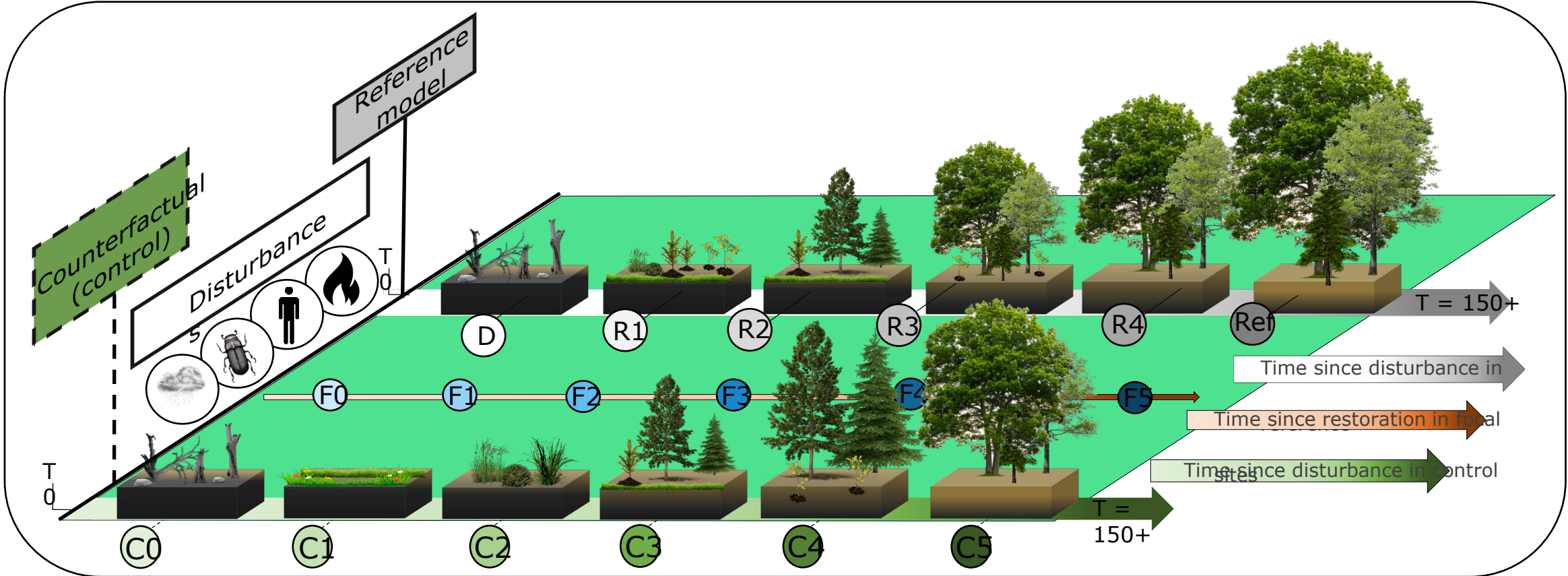


Mobile laser scanner

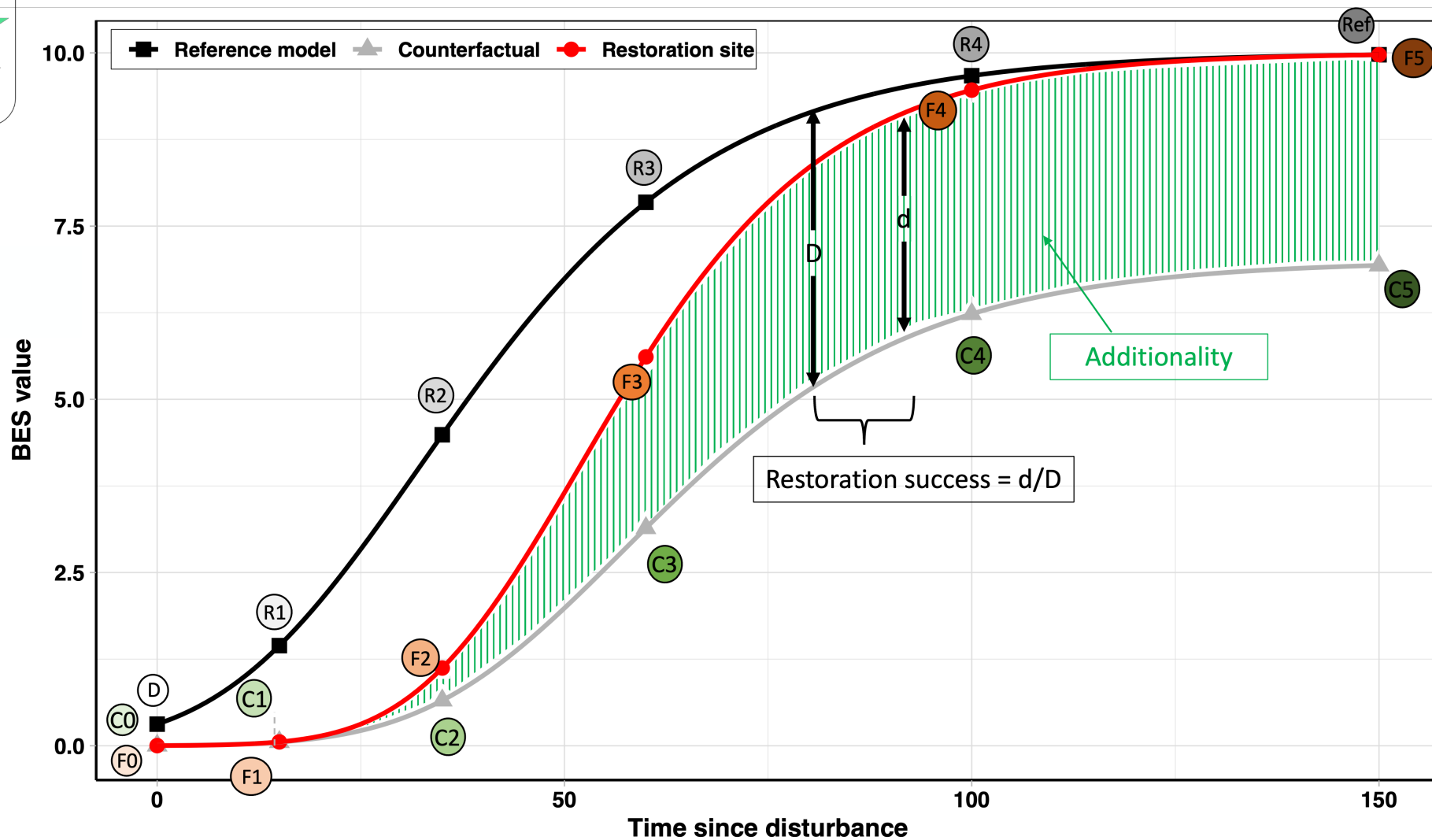
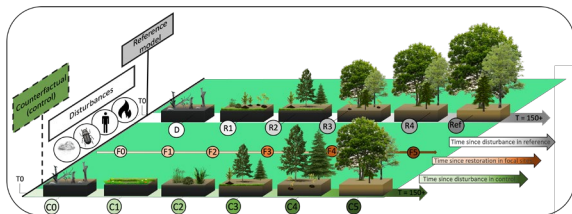


Characterization of forest stand structure

# Chronosequence design

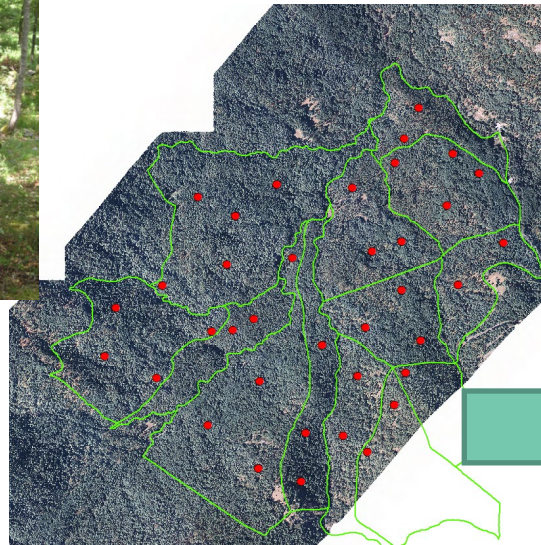


# Reference and Counterfactual

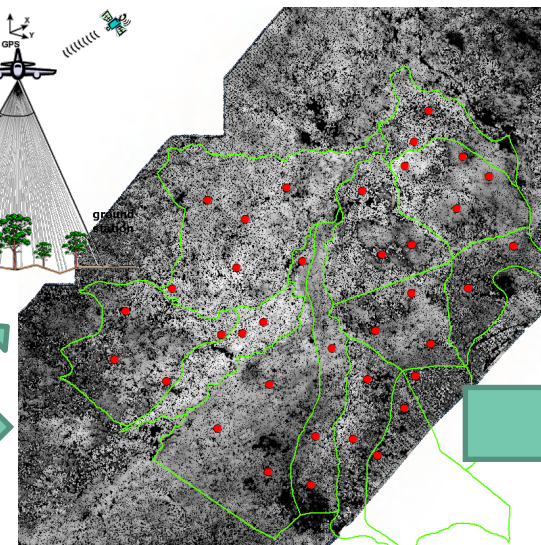
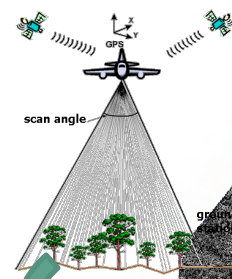




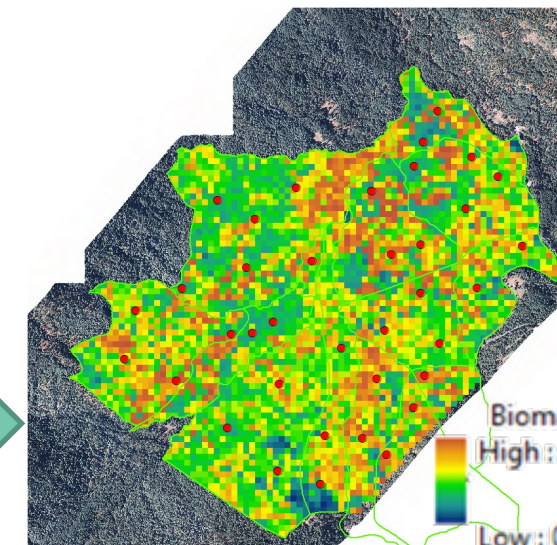
# Principle of Conservativeness



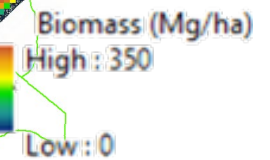
**Data acquisition**



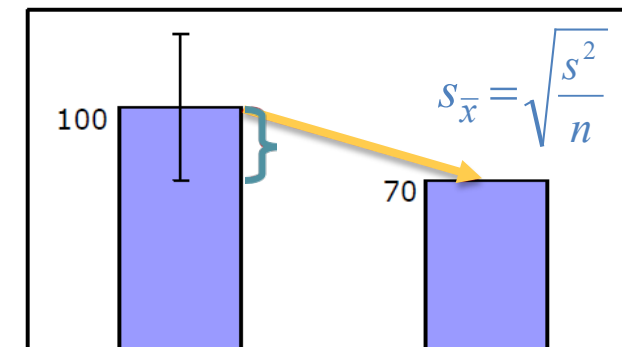
**Modelling**



**Estimation**



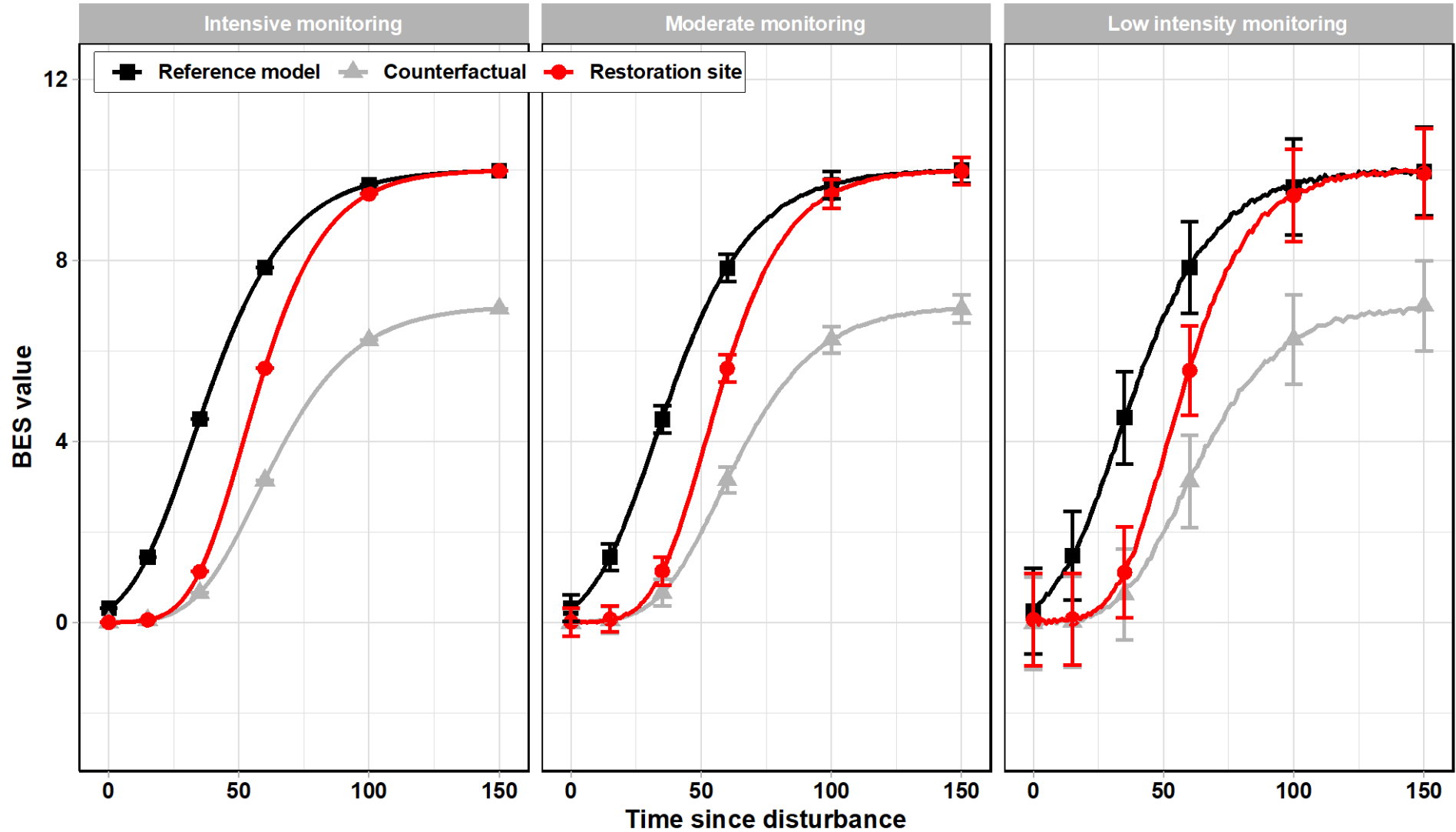
- **The role of remote sensing:** cost-efficiency in field data vs. field + RS data in reducing uncertainty of estimates.
- **Principle of conservativeness in REDD:** money is only granted for the lower confidence interval of biomass estimate.



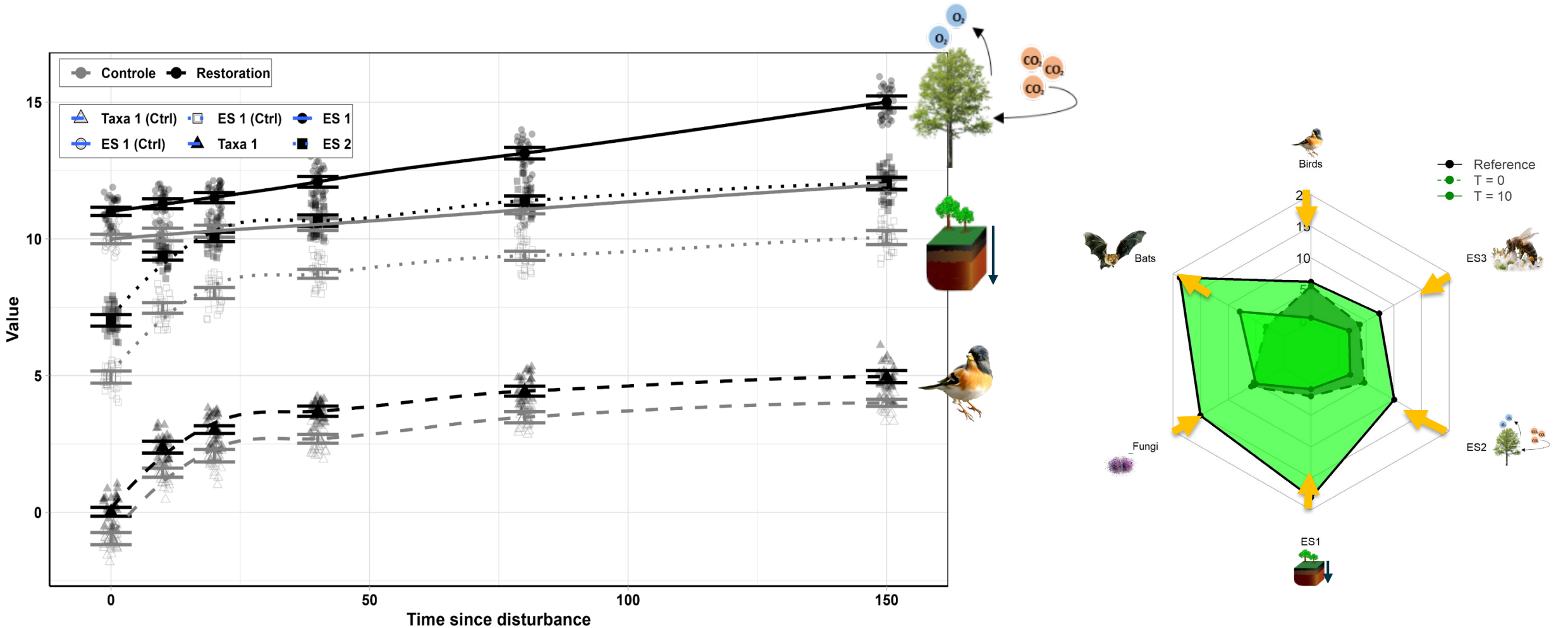
# Effect of Monitoring Intensity



- The reduction of uncertainty due to increasing the monitoring effort (e.g. by involving the use of remote sensing data) should be measured so that it can be paid for.



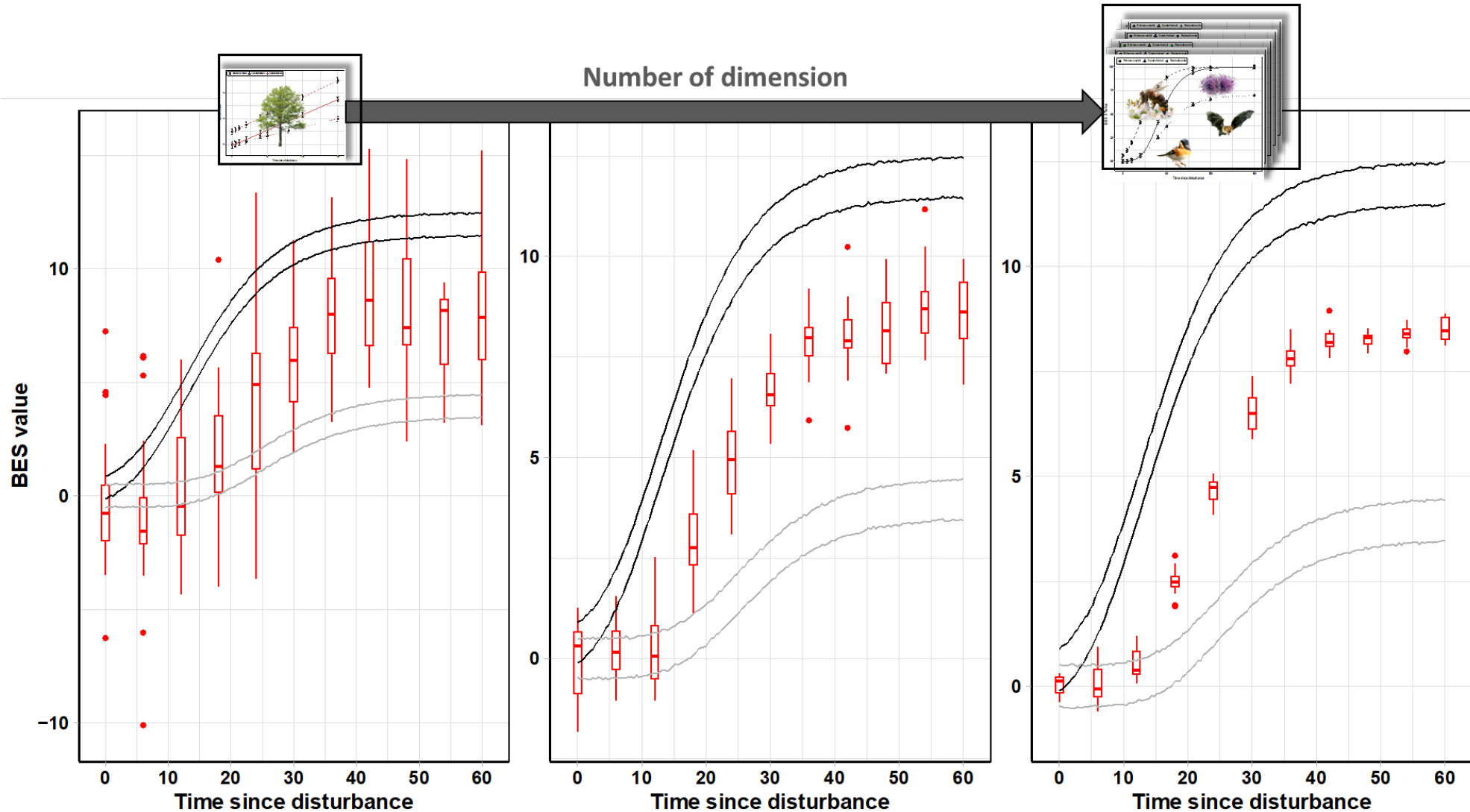
# Synergies and Trade-offs among Ecosystem Services



# Effect of Measuring more Ecosystem Services



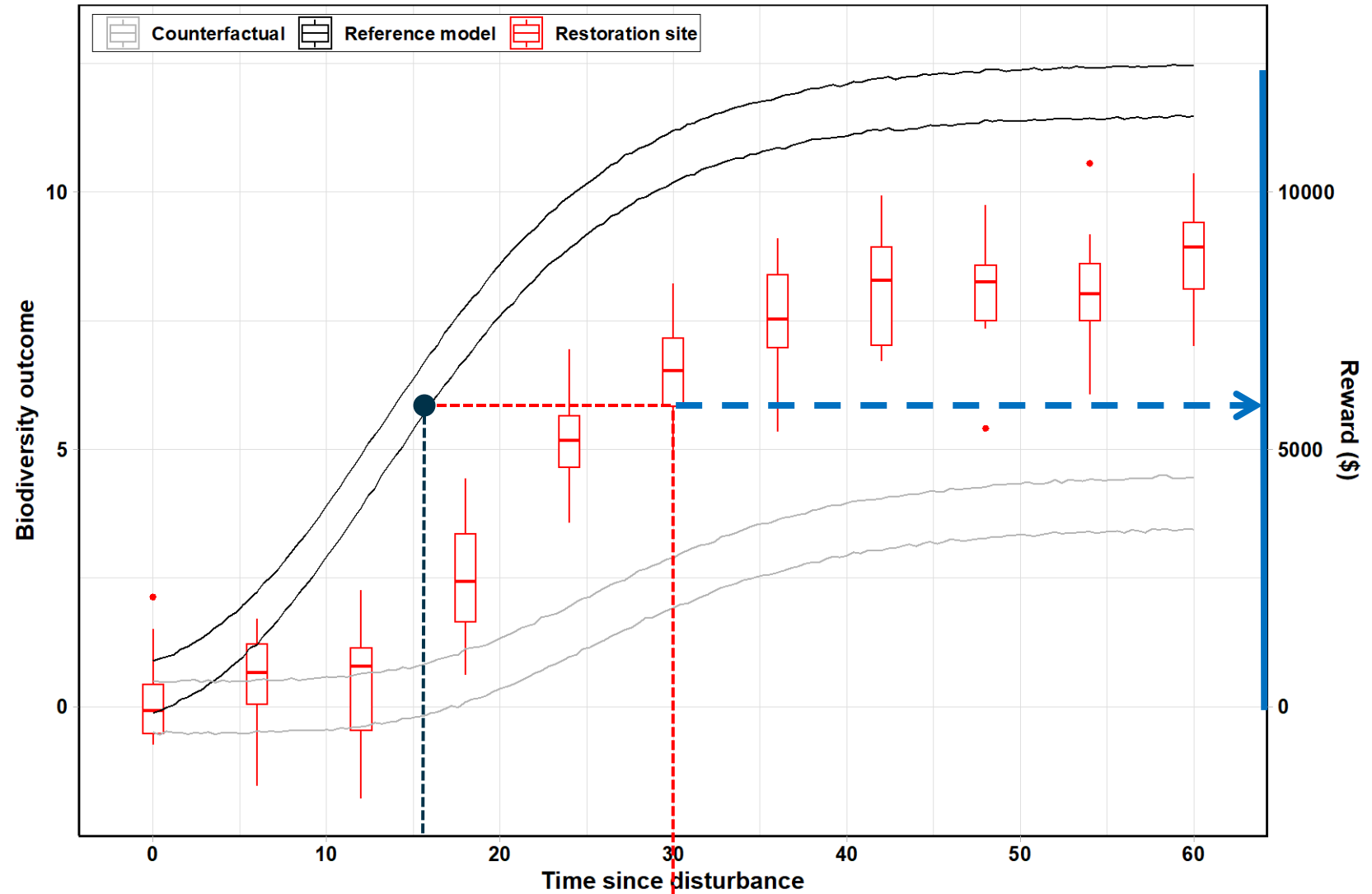
- Multidimensionality also increases our confidence in the restoration success, again enabling to pay for the effort of measuring more Ecosystem Services



# Enabling the financing



- The MRV-BES framework provides a common scale (between counterfactual and reference) that measures additionally in BES.
- Once that scale is been established, its value can be determined by a current market (e.g. carbon markets), which gives a monetary value to that scale, enabling the determination of the monetary value of all other BES under that same scale.



# Three key recommendations



- The value of biodiversity is the relative value of measured additionality which, once established for other Ecosystem Services with a current market, can give a monetary value to all BES.
- We advocate for prioritising the development of a network of counterfactuals (models of business-as-usual) and reference sites (conservation and restoration goals), which would facilitate to establish the value of conservation / restoration actions.
- Determining the value of Remote Sensing indicators of biodiversity assets at these networks of reference and counterfactuals would enable the use of those same indicators to finance individual restoration actions