

HORIZON-call: Conservation and protection of
carbon-rich and biodiversity-rich forest
ecosystems (RIA)

Safeguarding biodiversity and carbon-rich forest networks in Europe (SafeNet, 2025-2029)

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the European Union



Current challenges and research needs



Climate change
& disturbances



Habitat loss &
fragmentation



Limited
understanding
of biodiversity



Incomplete
monitoring
techniques



Unsustainable
management
practices



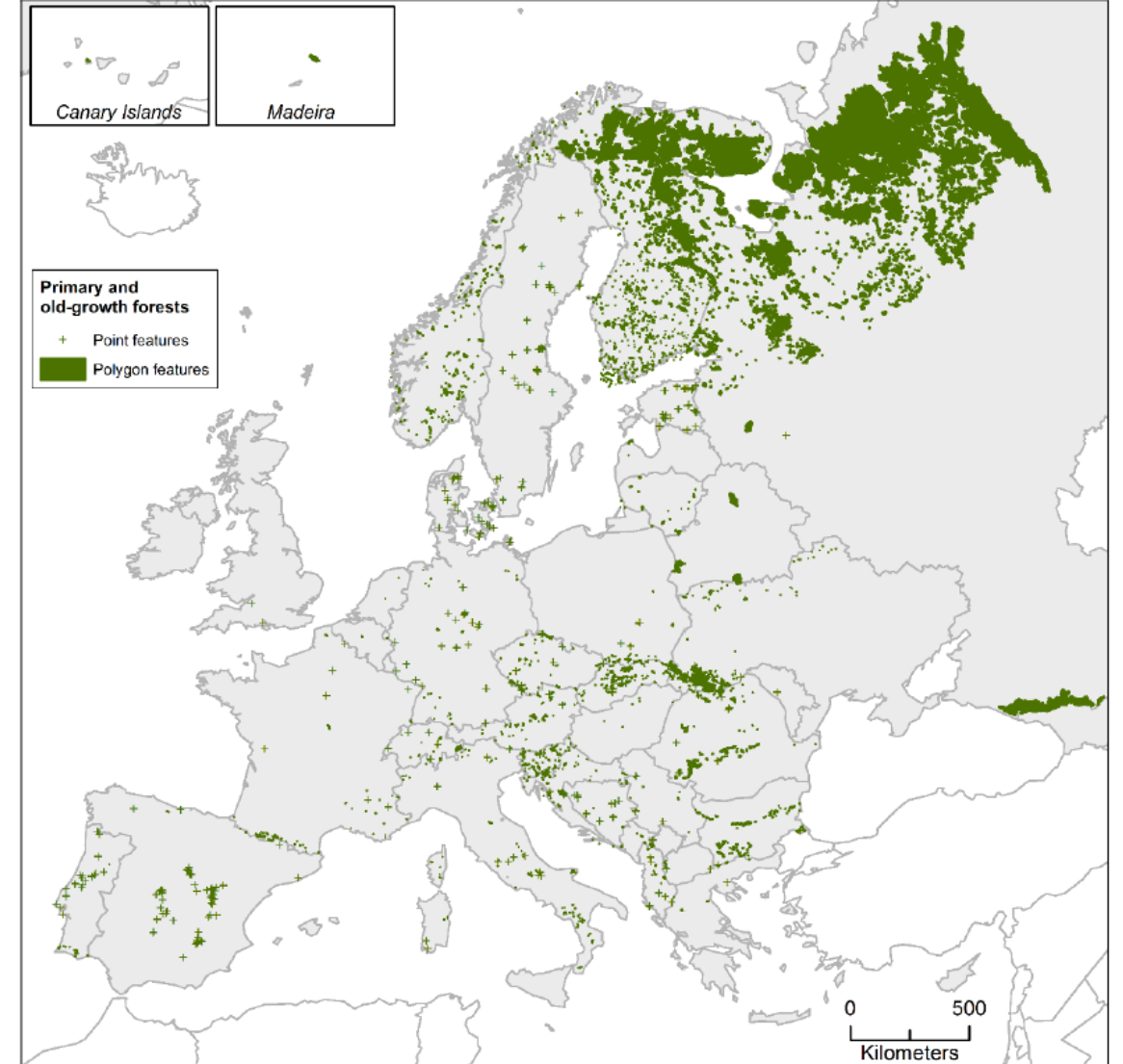
Conflicting
needs

- Impacts and drivers of BD loss for supporting conservation
- Methods to quantify BD and identify potential conservation areas
- Information and approaches to foster species co-migration across landscapes
- Knowledge of best practices for sustainable forest management and conservation under climate change
- Socio-economically feasible conservation and management of forests
- Stakeholder awareness about the climate impacts on BD and appropriate forest management and conservation

POGF – Primary and old-growth forests

- < 3% of European forests
- Data deficits in: Sweden, Italy, Bulgaria, Estonia, Romania
- Median size estimate 20-50 ha

Figure 2. Documented primary and old-growth forests in Europe according to the European Primary Forest Database (EPF v2.0) of Sabatini et al. (2020a) and UNESCO's Primeval Beech Forests of the Carpathians and Other Regions of Europe (UNEP-WCMC 2021). Note that the boundary of the polygons was highlighted for better readability.



Barredo et al. 2021. Mapping and assessment of primary and old-growth forests in Europe. Publications Office of the European Union.

Connectedness of the environment

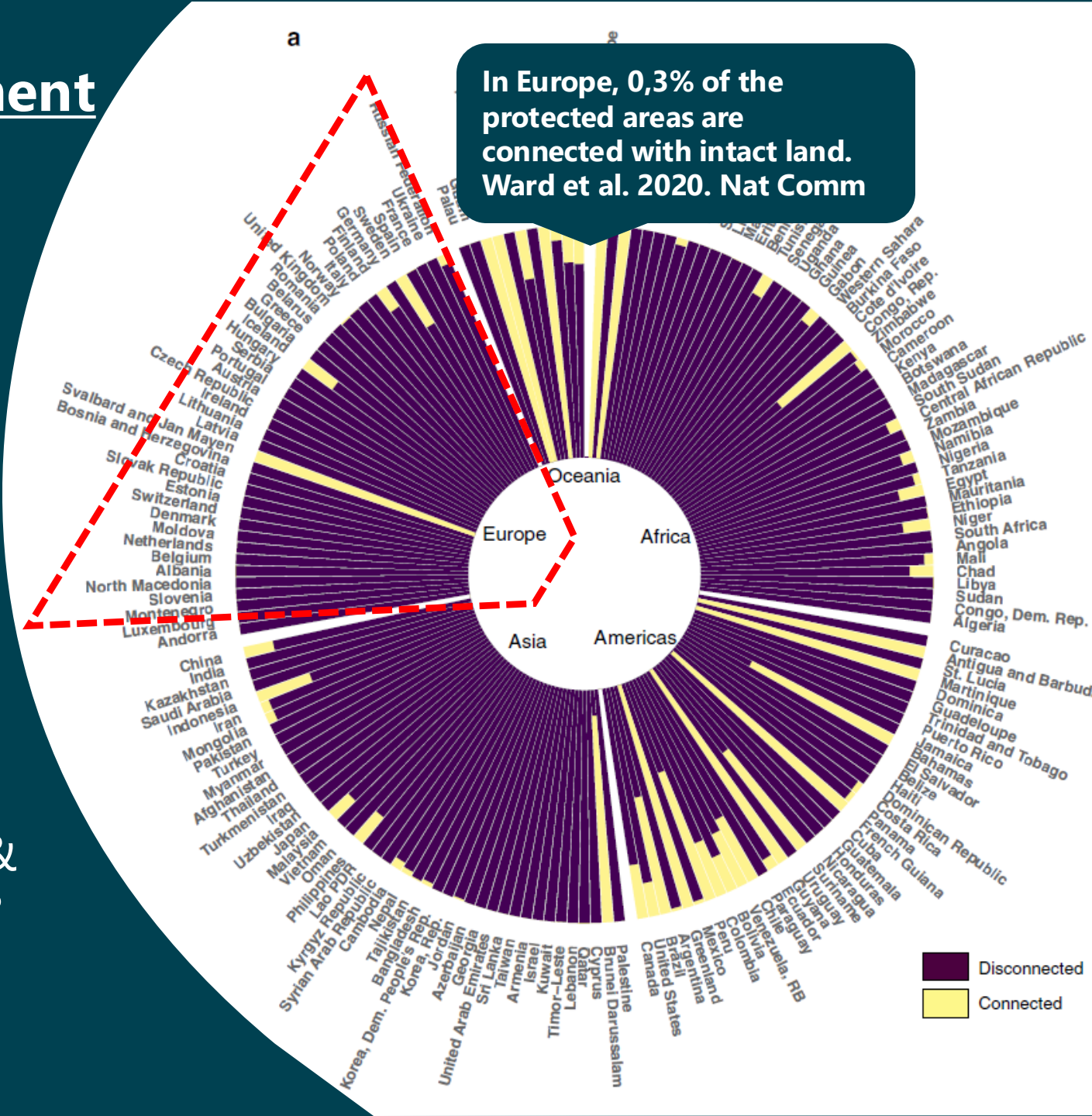
Climate change will inevitably shift distribution of ecosystems



How species can migrate with moving climate and ecological niches?



How to design and manage forest networks to support migration & BD & provision of other ecosystem services?



Objectives

- **Develop methods to quantify, monitor and map biodiversity and climate aspects of European forest ecosystems.**
- **Predict the impacts of climate change on forest biodiversity, migration and climate refugia.**
- **Identify and evaluate forest management approaches to support biodiversity & CC**
- **Develop conservation options for safeguarding biodiversity in European forests, while reconciling socio-economic conflicts**
- **Co-create solutions to foster forest ecosystem biodiversity and resilience with stakeholders**
- **Disseminate, communicate project's results to accelerate the uptake of solutions among stakeholders.**

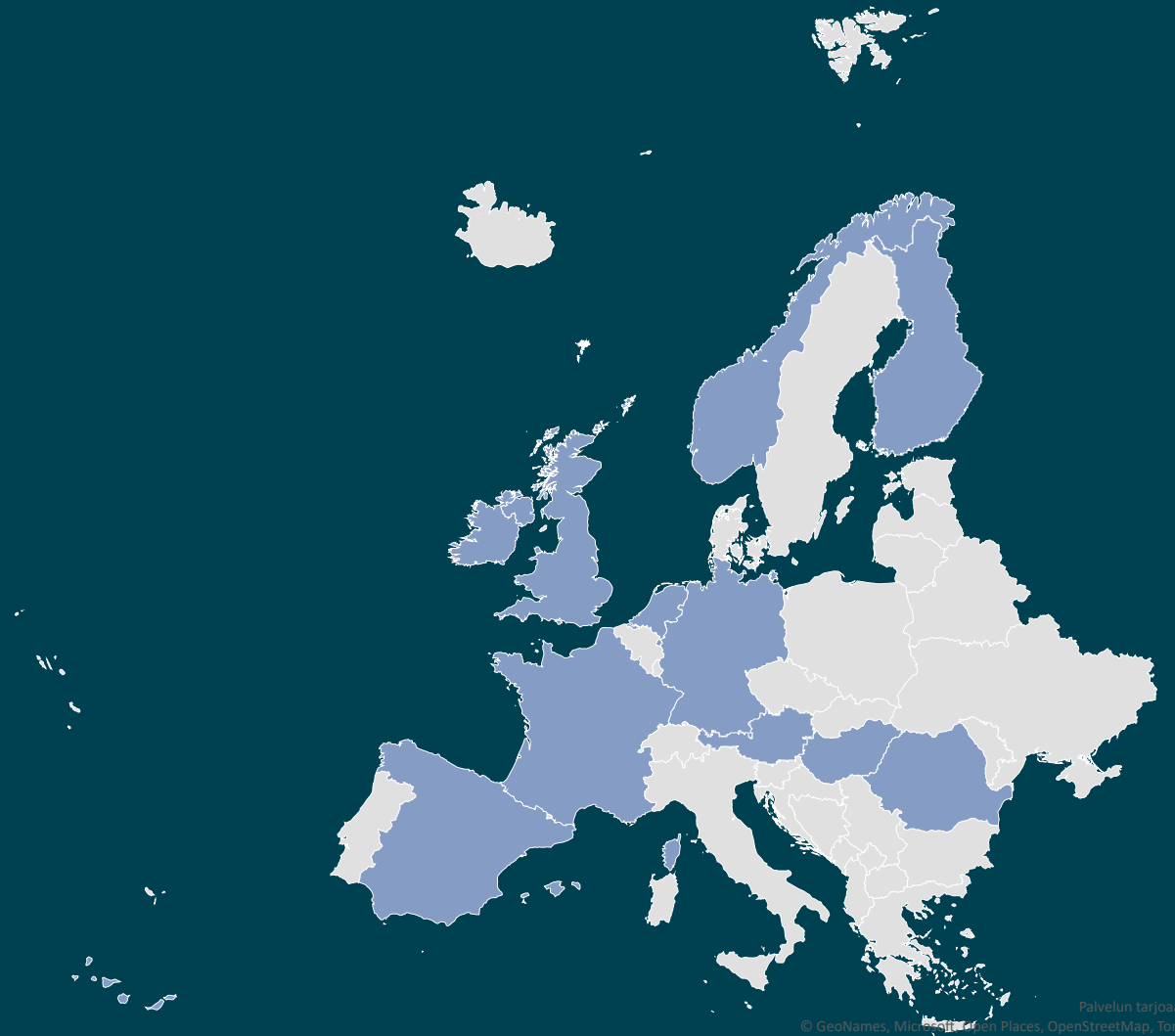
SafeNet Partners

Luke	Natural Resources Institute Finland [Coordinator, WP7 & WP9 leader]	Finland
ESSRG	ESSRG Nonprofit KFT [WP1 leader]	Hungary
JYU	University of Jyväskylä [WP2 leader]	Finland
ULEEDS	University of Leeds [WP3 leader]	UK
IIASA	International Institute for Applied Systems Analysis [WP4 leader]	Austria
UPM	Technical University of Madrid [WP5 leader]	Spain
NMBU	Norwegian University of Life Sciences [WP6 leader]	Norway
ERINN	ERINN Innovation Limited [WP8 leader]	Ireland
VUA	Vrije University Amsterdam	Netherlands
TUM	Technical University of Munich	Germany
TUD	Technical University of Dresden	Germany
FSC	FSC International Center GmbH	Germany
UniTBv	Transilvania University of Brasov	Romania
SP	Science Partners	France

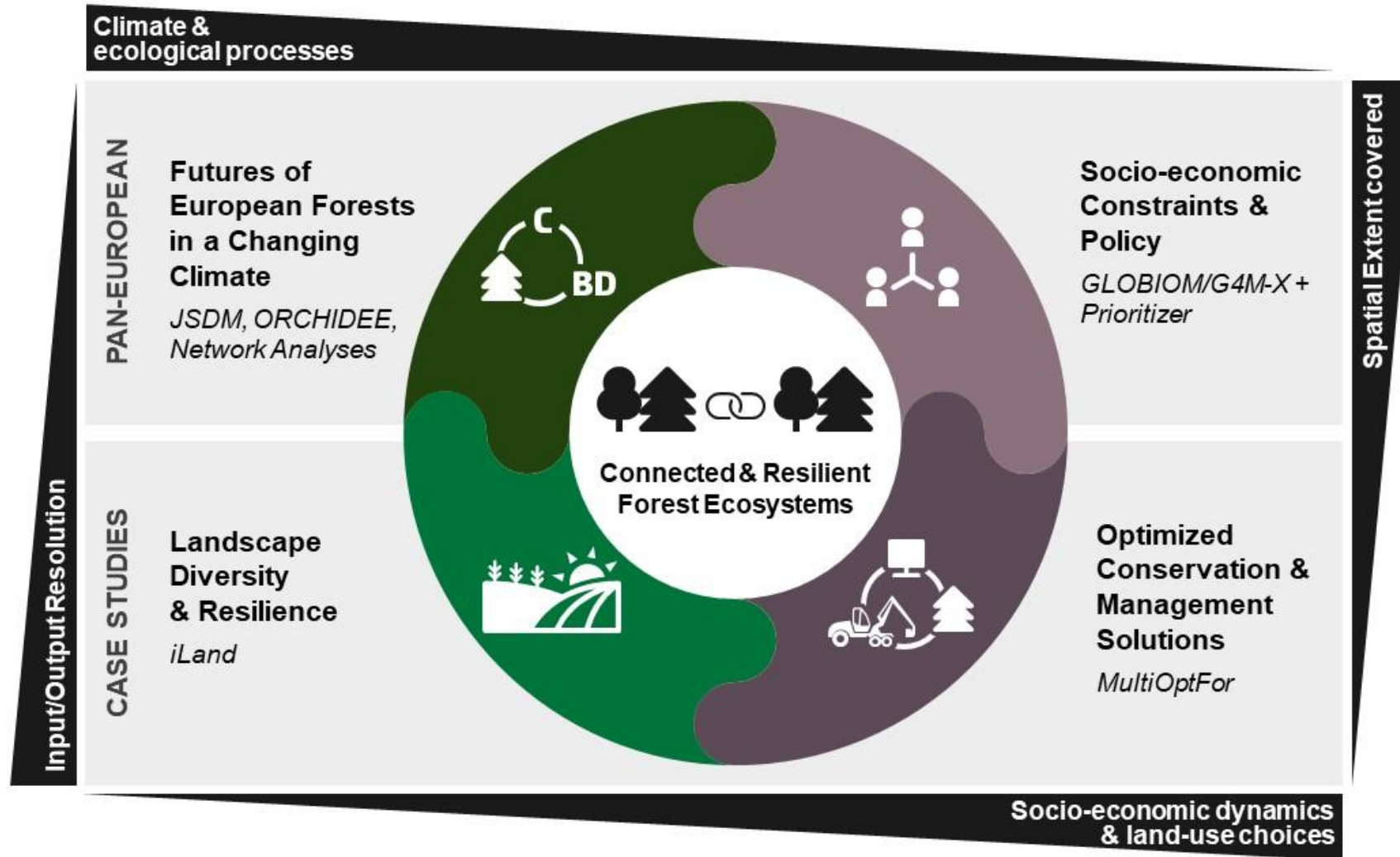
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SafeNet's ecological, economic and bio-physical modelling frameworks at different spatial resolutions



WP1 Co-creating innovative policies and conservation measures

WP2 Monitoring & mapping ecologically valuable & carbon-rich forests in Europe

WP3

Futures of European forests in a changing climate

WP4

Socio-economically Sustainable Forest Management & conservation

WP5

Priorities for improving the connectivity & resilience of the forest

WP6

Local impacts of conservation & protection strategies

WP7

Conservation options for primary, old-growth and high-ecological-value forests in Europe

WP8 Dissemination, Exploitation & Communication

WP9 SafeNet Coordination & management

WP1 Co-creating innovative policies and conservation measures

WP lead: Eszter Kelemen (HU), Environmental Social Science Research Group (ESSRG)

- Living Labs in case study regions and at the European level
- Identify main socio-economic and political factors, barriers and enablers for the adaptation and conservation
- Co-develop socio-economically feasible policy recommendations for stricter protection of POGFs

★ **SafeNet** case study areas /
locations of living labs

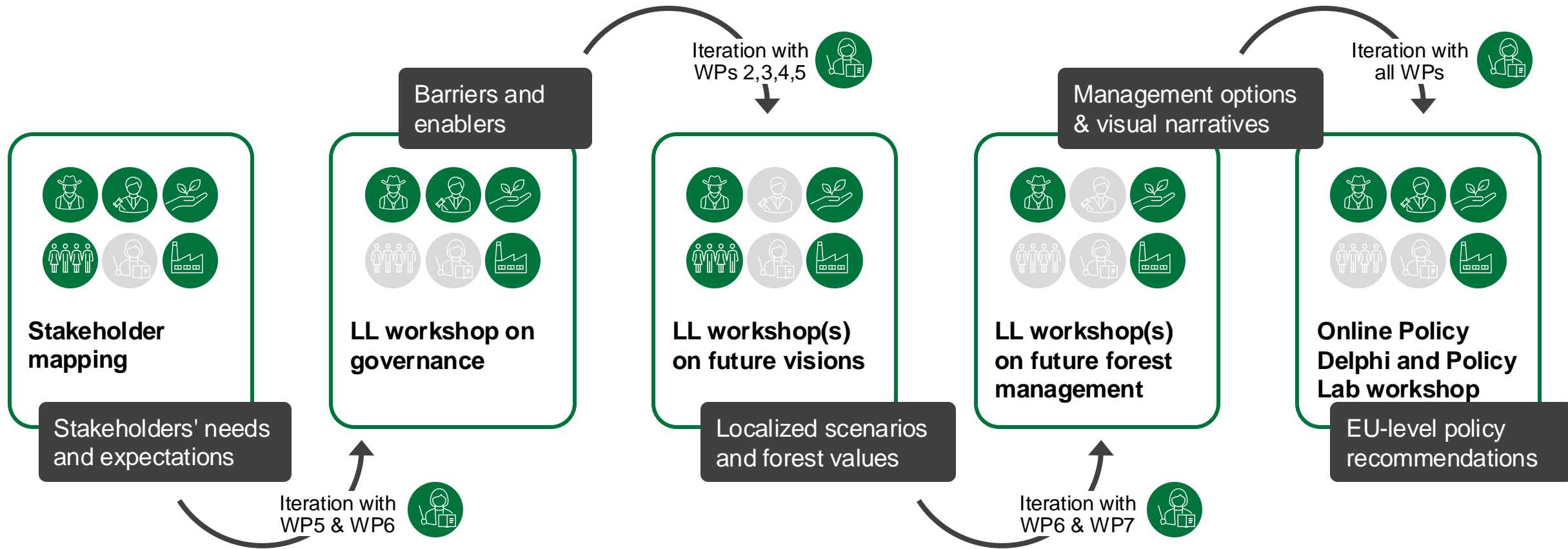
- Climate and conservation challenges
- Different governance structures
- A proportion of managed and conserved forest area
- FSC certified area
- Good data coverage, incl. BD data







CS-A, LL-A Mediterranean
"Eastern Sierra Morena"



CS-B, LL-B Alpine "Berchtesgaden"

CS-C, LL-C Temperate
"Brasov"

CS-D, LL-D Boreal "Evo"



-  Forest managers
-  Policy actors
-  Conservation actors
-  Communities and other social groups
-  Scientific community
-  Forest industry and value chain actors

 Involved
 Not involved

WP2 Monitoring & mapping ecologically valuable & carbon-rich forests in Europe

WP lead: Otso Ovaskainen, JyU

To develop field and EO-monitoring of biodiversity and detection of ecologically valuable forests, incl. primary and old-growth forests (POGF)

- Improve the identification of POGF based on using remote sensing time series
- Develop and tailor semi-automated and standardized multi-taxon BD field-monitoring methods
- Develop species distribution models (JSDM)

- 
- Collaborative BD sampling sites (LifePlan)
 - Collaborative BD sampling sites (BIOCAMP) (N.b. each location has 2 sampling sites)

WP3 Futures of European forests in a changing climate

Lead: William “Bill” Kunin, University of Leeds

To assess direct and indirect effects of CC on the distribution, structure and composition of European forests and species communities

- Identify sustainable forest management options under climate change by evaluating the impacts of management on C, wood provision, water cycle and BD (ORCHIDEE)
- Scenarios of forest development and biodiversity under different climate, management and LU scenarios (JSDM)
- Identify potential climate refugia - extinction debt hotspots

WP4 Socio-economically Sustainable Forest Management & conservation

WP lead: Fulvio di Fulvio, IIASA (Austria)

To identify policy-relevant management and conservation scenarios that contribute to BD and climate goals, while considering broader societal demands for forests

- Spatial multi-criteria optimization of potential future PAs and restoration areas
- Reconciled forest management scenarios according to bioeconomy demands & climate mitigation and conservation objectives (Restoration Law)
- Leakage effects of EU conservation policies globally

WP 5 Priorities for improving the connectivity & resilience of the forest

WP lead: Santiago Saura, Polytechnic University of Madrid

To identify the key migration routes and connectivity bottlenecks between and to provide guidance for the targeted conservation, restoration or management

- Identify & prioritize key migration routes & functional corridors
- Key areas for restoration and conservation to increase connectivity under climate change
- Potential role of assisted tree migration to maximize dynamic gene conservation

WP 6 Local impacts of conservation & protection strategies

WP lead: Kyle Eyvindson, NMBU

To identify optimal management practices and strategies to achieve local conservation targets under uncertain climate and disturbance regimes.

- Co-design forest and landscape management scenarios with stakeholders in LL
- Optimized forest management and conservation of real landscapes (MultiOptForest)
- New tool: develop an interactive optimization tool for integrating management and conservation

WP 7 Conservation options for primary, old-growth and high-ecological-value forests in Europe

WP lead: Luke

To consolidate knowledge produced in the project to support EU needs for the protection of POGFs, HCVPs and carbon-rich forests.

- Evaluate the impacts of past conservation management practices on forest integrity and on the species and habitats
- Roadmap for conserving biodiversity and carbon-rich forests in Europe in future

SafeNet

2025-2029

- **Holistic predictions** of future forest configurations, biodiversity & carbon under climate change & land-use change scenarios
- **Identification** of migration routes & future connectivity bottlenecks & protection areas
- **Integrated** field & remote sensing techniques to monitor & map biodiversity & primary and old-growth forests
- **Road-map** for strict protection of primary & old-growth forests of Europe
- **Spatially optimized & reconciled management & conservation** under different scenarios safeguarding biodiversity

Thank you!

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VU Amsterdam: Sebastiaan Luyssaert

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