Harnessing forest genetic resources for increasing options in the face of environmental and societal challenges

- **Dates**: November 1st, 2022 – October 31st, 2027 (five years)
- **Code**: **101081774**
- **Topic**: HORIZON-CL6-2022-**BIODIV**-01-07
- **Research and Innovation Action, RIA**
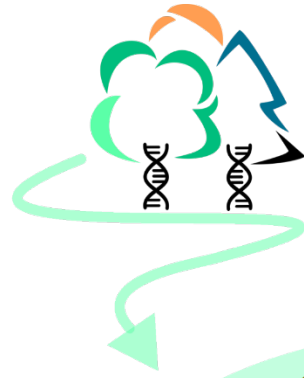- **19 partners**
- **Budget**: 8,008,387 EUR

Funded by the European Union

EU context

3 BILLION TREES BY 2030

European Commission

July 2021
#EUForests
#EUGreenDeal

Under the European Green Deal, the EU Biodiversity Strategy commits to **plant at least 3 billion additional trees in the EU by 2030**. **A roadmap** in the EU Forest Strategy outlines how the Commission will facilitate the achievement of this pledge.

TREE PLANTING SHOULD NOT BE SEEN AS AN ALTERNATIVE TO PRESERVING EXISTING TREES, WHICH REMAINS THE FIRST PRIORITY, BUT AS AN ADDITIONAL EFFORT TO INCREASE TREE COVER IN THE EU

OPTFORESTS

Funded by the European Union

Project concept

OPTFORESTS

BIODIVERSITY at all levels is key to increasing the **RESILIENCE** of forests in the fase of climate change

SUSTAINABLE DEVELOPMENT GOALS
13 Climate action • 15 Life on land • 17 partnership for the goals

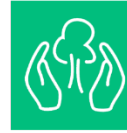**EU BIODIVERSITY & NEW EU FOREST STRATEGIES FOR 2030**

PROJECT OBJECTIVES

1. Supporting diverse & adapted FRM for future climate
2. Fostering sustainable use & resilience of natural forests
3. Expanding nursery capacity, diversity & cooperation
4. Developing NBS & new cultural trajectories
5. Demonstrating forest biodiversity restoration solutions

EXPECTED OUTCOMES
Via socio-economic analysis & tailored communications

- Cooperation & Knowledge sharing on deploying and conserving forest genetic resources (FGR) in Europe
- Conservation of unique tree lineages for forest ecosystem restoration
- Sustainable use of FGR in a climate change context
- Efficient implementation of the Access and Benefit Sharing (ABS) Regulation in the EU

LONG-TERM IMPACTS

- ◆ NBS for competitive sustainability & for tackling climate change and natural disasters
- ◆ Biodiversity & ecosystem services provision in forestry
- ◆ Access to a wider range of breeds with a broadened genetic base
- ◆ Enabling transformative changes in society
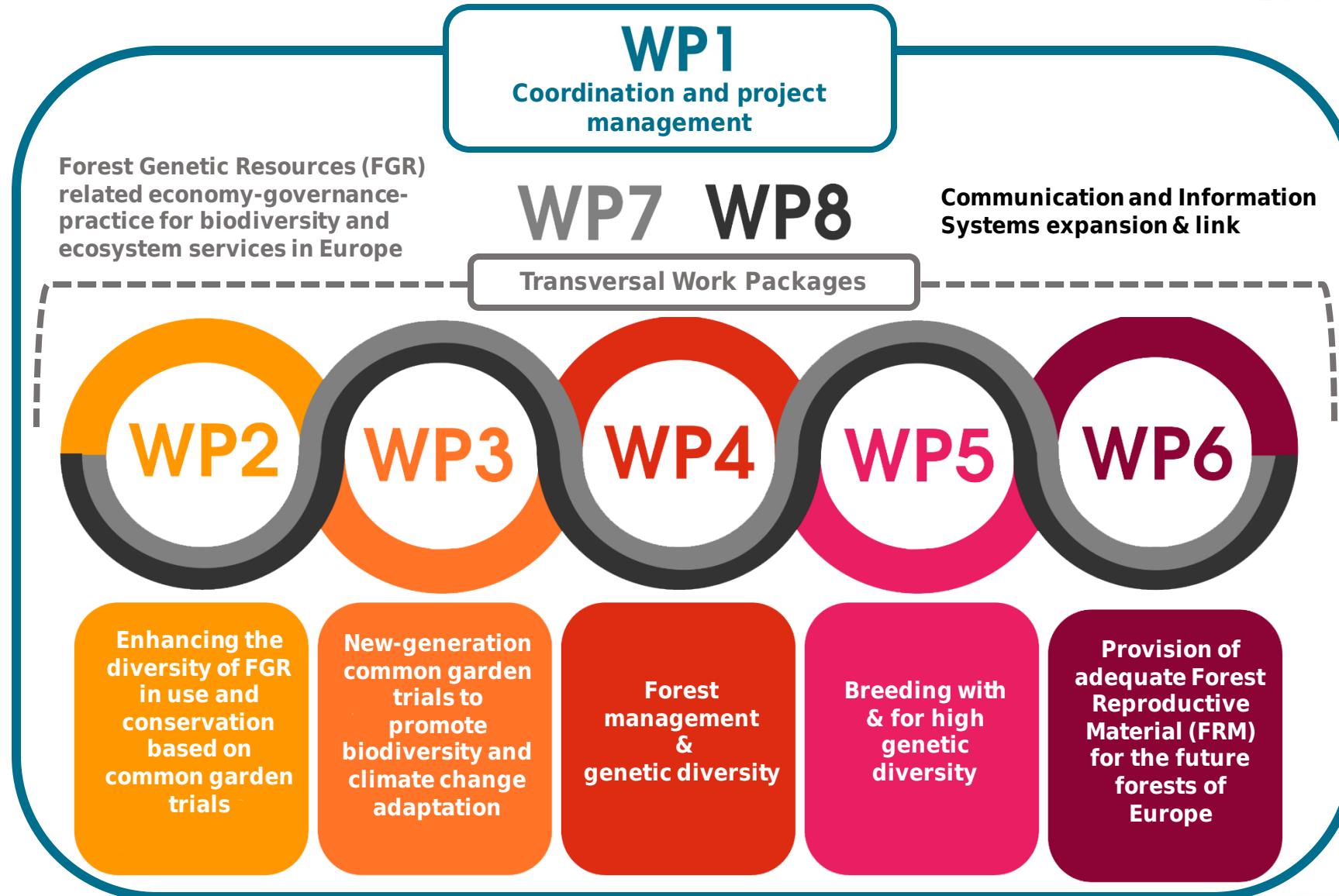- ◆ Biodiversity research interconnected across Europe

Geographical scope

OptForests is covering all main biogeographical regions in Europe
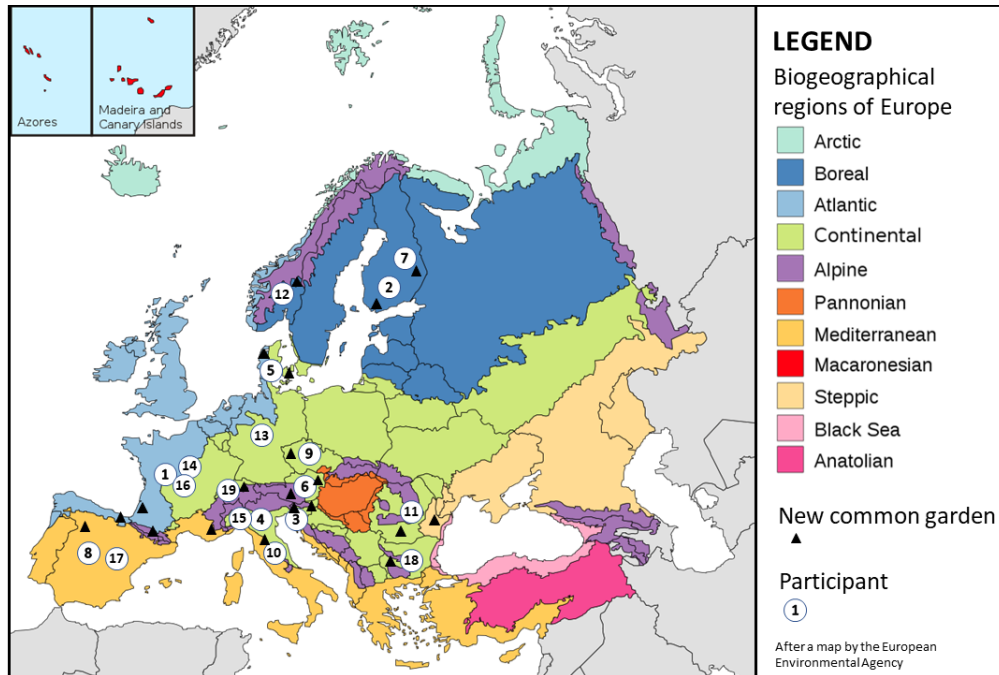
Species	Latin name (biogeographical region)	DIV	Work package				
			WP2	WP3	WP4	WP5	WP6
Firs	*Abies alba* (A/C)						
	Med. Abies spp. (M)						
Maple	*Acer pseudoplatanus* (A/C)						
Birch	*Betula pendula* (B/A/C/AT)						
Chestnut	*Castanea sativa* (C/M)						
Cedars	*Cedrus spp.* (A/C/AT/M)						
Beech	*Fagus sylvatica* (B/A/C)						
Ash	*Fraxinus excelsior* (B/A/C)						
	F. angustifolia (A/C/M)						
Larch	*Larix decidua* (A/C)						
Norway spruce	*Picea abies* (B/A/C)						
Pines	*Pinus halepensis* (M)						
	P. nigra (A/C/M)						
	P. pinaster (AT/M)						
	P. pinea (M)						
	P. sylvestris (B/A/C/AT/M)						
Wild cherry	*Prunus avium* (B/A/C/AT/M)						
White oaks	*Quercus pubescens* (C/M)						
	Q. petraea (B/C/AT/M)						
	Q. pyrenaica (C/M)						
	Q. robur (B/C/AT)						
	Q. frainetto (C/M)						
Linden	*Tilia cordata* (B/A/C)						

And a variety of forest trees, including underused species that will have bigger roles in the future

Project Work Packages

WP1
Coordination and project management

Forest Genetic Resources (FGR) related economy-governance-practice for biodiversity and ecosystem services in Europe

WP7   WP8

Communication and Information Systems expansion & link

Transversal Work Packages

WP2 — Enhancing the diversity of FGR in use and conservation based on common garden trials

WP3 — New-generation common garden trials to promote biodiversity and climate change adaptation

WP4 — Forest management & genetic diversity

WP5 — Breeding with & for high genetic diversity

WP6 — Provision of adequate Forest Reproductive Material (FRM) for the future forests of Europe
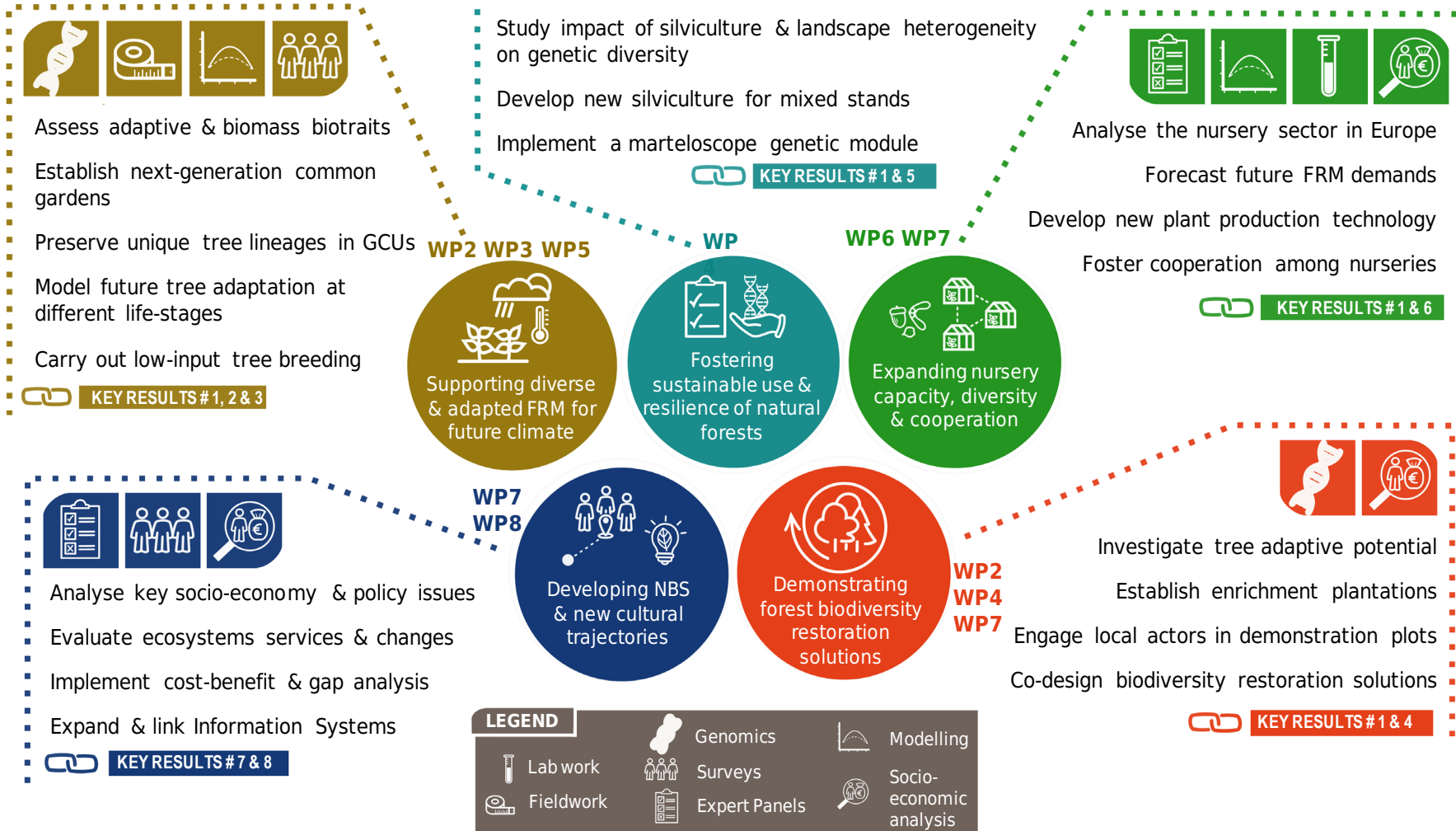
Project Structure

- **WP1** – Coordination and project management, INRAE (Santiago C. González-Martínez), France

- **WP2** – Enhancing the diversity of FGR in use and conservation based on common garden trials, Luke (Egbert Beuker), Finland

- **WP3** – Next-generation common garden trials to promote biodiversity and climate change adaptation, GIS (Marjana Westergren), Slovenia

- **WP4** – Forest management and genetic diversity, INRAE (François Lefèvre), France

- **WP5** – Breeding with and for high genetic diversity, University of Copenhagen, UCPH (Erik Dahl Kjær), Denmark

- **WP6** – Provision of adequate FRM for the future forests of Europe, BFW (Heino Konrad), Austria

- **WP7** – FGR-related economy-governance-practice for biodiversity and ecosystem services in Europe, University of Padova, UNIPD (Laura Secco), Italy

- **WP8** – Communication and Information Systems expansion and link, EFI (Anna-Maria Farsakoglou), International

Project Methodology

Apply eco-evo dynamics framework

Study impact of silviculture & landscape heterogeneity on genetic diversity

Develop new silviculture for mixed stands

Implement a marteloscope genetic module

KEY RESULTS # 1 & 5

Assess adaptive & biomass biotraits

Establish next-generation common gardens

Preserve unique tree lineages in GCUs

Model future tree adaptation at different life-stages

Carry out low-input tree breeding

KEY RESULTS # 1, 2 & 3

Analyse the nursery sector in Europe

Forecast future FRM demands

Develop new plant production technology

Foster cooperation among nurseries

KEY RESULTS # 1 & 6

WP2 WP3 WP5
Supporting diverse & adapted FRM for future climate

WP
Fostering sustainable use & resilience of natural forests

WP6 WP7
Expanding nursery capacity, diversity & cooperation

WP7 WP8
Developing NBS & new cultural trajectories

Demonstrating forest biodiversity restoration solutions
WP2 WP4 WP7

Analyse key socio-economy & policy issues

Evaluate ecosystems services & changes

Implement cost-benefit & gap analysis

Expand & link Information Systems

KEY RESULTS # 7 & 8

Investigate tree adaptive potential

Establish enrichment plantations

Engage local actors in demonstration plots

Co-design biodiversity restoration solutions

KEY RESULTS # 1 & 4

LEGEND

- Lab work
- Fieldwork
- Genomics
- Surveys
- Expert Panels
- Modelling
- Socio-economic analysis

Key Results

Key result #1

Recommendations formulated for deployment of adaptable FRM matched to future climates, including unique tree lineages for forest ecosystem restoration and management, and assisted gene flow or migration.

Key result #2

A **European network of 20 next-generation common gardens established** (+2 additional in UK, to be established with own funding), containing provenance and species mixtures and unique tree lineages that will form the basis for future climate change adaptation and forest biodiversity research.

Key result #3

Forest management and (low-input) breeding strategies that optimise the use of genetic diversity for adaptation delineated, aiming especially at the establishment and management of new mixed forests.
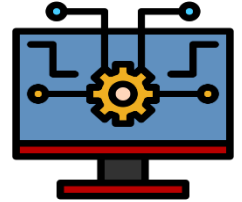
Key result #4

Enrichment plantations in declining forests and **demonstration plots in ecosystem restoration projects carried out in six countries** in cooperation with local stakeholders.
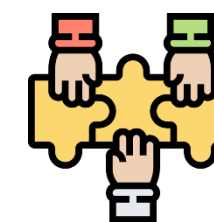
Key Results

Key result #5

A genetic module developed and tested for **training software simulating the impact of silviculture on genetic diversity** to raise the awareness of forest managers of new FGR-oriented management practices.

Key result #6

Proposals for expansion of capacity (including new techniques for FRM production) and **increased cooperation among nurseries** formulated, based on in-depth analysis of the nursery sector in Europe and modelling of future FRM demand.
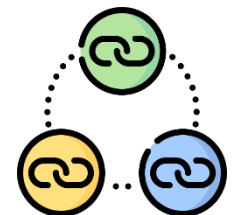
Key result #7

Socially acceptable adaptive solutions developed and prioritised to improve biodiversity and ecosystem services based on FGR, including the needed technical, social, economic and institutional changes to be implemented.

Key result #8

FOREMATIS and EUFGIS Information Systems linked in order to support end users when making decisions about where to source or plant FRM, and recommendations proposed for the traceability of FRM performance.

Thank you for your attention!