# FOREGEN WORKSHOP

## Is natural regeneration effective to restore European forests after climate change-related disturbances?

**13 – 14 November 2023, INRAE - Bordeaux, France**

### Background

Reforestation is at the core of the EU green policies. As such, the new EU Forest Strategy for 2030, as part of the Biodiversity Strategy and the European Green Deal, is committed to planting 3 billion additional trees in the EU by 2030. Yet, successful reforestation cannot only rely on tree planting, and a thorough understanding of how European forests regenerate under climate change-related disturbances is urgently needed. Therefore, defining forest restoration goals that include regeneration is an urgent and major task.

Forest ecosystem recovery after disturbance is a complex process that can follow pathways from complete resilience to complete ecosystem shift (Seidl and Turner 2022). Post-disturbance forest regeneration modulates forest composition and structure and has major implications for biodiversity and ecosystem services in the long-term (Cook-Patton et al. 2020; Hanbury-Brown et al. 2022; Seidl and Turner 2022). The ecological processes that leverage forest regeneration after disturbance comprise tree recruitment from reproduction to establishment (Seidl and Turner 2022), and their evaluation and eventual prediction require an integrated understanding of the underlying biological mechanisms (Clark et al. 1999; Wang and Smith 2002; García et al. 2020; Hampe et al. 2020).

### Objectives

In this workshop we will discuss the forests that we want for the future and whether natural regeneration will be effective to restore them. Focusing on degraded areas as a consequence of climate change and where restoration is required, we will i) **identify forest restoration goals** considering ecological (ecological services, functional and genetic diversity, productivity, selecting adapted forest reproductive material etc), economic (wood and paper production), societal and policy (stakeholders and government agreements) aspects; ii) discuss **whether regeneration will be effective to cover our restoration goals** through the

evaluation of pros/cons/limitations of tree regeneration in the context of climate change; iii) discuss the potential of **planting vs. regeneration (managed and unmanaged) strategies** to fulfill the proposed forest restoration goals.

### Expected output

Opinion paper focused on forest regeneration under climate change related disturbances based on the discussions generated during the workshop.

### References


Clark JS, Beckage B, Camill P, et al (1999) Interpreting recruitment limitation in forests. American Journal of Botany 86:1–16. https://doi.org/10.2307/2656950

Cook-Patton SC, Leavitt SM, Gibbs D, et al (2020) Mapping carbon accumulation potential from global natural forest regrowth. Nature 585:545–550. https://doi.org/10.1038/s41586-020-2686-x

García C, Espelta JM, Hampe A (2020) Managing forest regeneration and expansion at a time of unprecedented global change. Journal of Applied Ecology 57:2310–2315. https://doi.org/10.1111/1365-2664.13797

Hampe A, Alfaro-Sánchez R, Martín-Forés I (2020) Establishment of second-growth forests in human landscapes: ecological mechanisms and genetic consequences. Annals of Forest Science 77:1–5. https://doi.org/10.1007/s13595-020-00993-7

Hanbury-Brown AR, Ward RE, Kueppers LM (2022) Forest regeneration within Earth system models: current process representations and ways forward. New Phytologist 235:20–40. https://doi.org/10.1111/nph.18131

Seidl R, Turner MG (2022) Post-disturbance reorganization of forest ecosystems in a changing world. Proceedings of the National Academy of Sciences 119:e2202190119. https://doi.org/10.1073/pnas.2202190119

Wang BC, Smith TB (2002) Closing the seed dispersal loop. Trends in Ecology & Evolution 17:379–386. https://doi.org/10.1016/S0169-5347(02)02541-7


## Workshop participants (project participation)

Miroslav Svodobova, CZU -WildE
Tom Nagel, University of Ljubljana – WildE
Jose Maria Rey Benayas, University of Alcalá – WildE
Josep Maria Espelta, University of Barcelona - WildE
Alba Lazaro Gonzalez, INRAE – WildE
Martina Dodan, CFRI – SUPERB
Koen Kramer, Land Life company – SUPERB
Mladen Ivanlovic, CFRI – SUPERB
Darjan Progovecki, CFRI – SUPERB
Marjana Westerngren, GIS – OPTFORESTS
François Lefevre, INRAE – OPTFORESTS
Santiago Gonzalez Martinez, INRAE – OPTFORESTS
Marion Carme, INRAE – OPTFORESTS

## Organizing committee

Marta Benito Garzon, INRAE – SUPERB/OPTFORESTS
Silvio Schueler, BFW – SUPERB/OPTFORESTS
Eduardo Vicente, INRAE – SUPERB
Arndt Hampe, INRAE - WildE
Albert Ciceu, BFW – SUPERB
Dev Chakraborty, BFW – SUPERB

**Working plan**

1) Presentations: each participant/member of the organizing committee (or group of participants if you come from the same team and wish to present together) will present his/her results/views on the main objective of the 3 main objectives. Each presentation will last 10' followed by 5' of discussion
2) Focusing to the objectives through our discussions: we will have 3 general discussions on the three main objectives.
3) Final discussion, where we will decide our task assignment and publication strategy.

**Worskhop agenda**

| | Monday 13th Nov | Tuesday 14th Nov |
|---|---|---|
| 9.00 – 9.15 | Workshop introduction & welcome (MBG) | Introduction |
| 9.15 – 10.30 | 10' presentations from each participant (10' presentation + 5' questions) | i) **identify forest restoration goals** considering ecological (ecological services, functional and genetic diversity, productivity, selecting adapted forest reproductive material etc), economic (wood and paper production), societal and policy (stakeholders and government agreements) aspects |
| 10.30 – 11.00 | Coffe break | |
| 11.00 – 12.30 | Presentationss | discuss **whether regeneration will be effective to cover our restoration goals** through the evaluation of pros/cons/limitations of tree regeneration in the context of climate change |
| 12.30 – 14.00 | Lunch | |
| 14.00 – 16.00 | Presentations | discuss the potential of **planting vs. regeneration (managed and unmanaged) strategies** to fulfill the proposed forest restoration goals |

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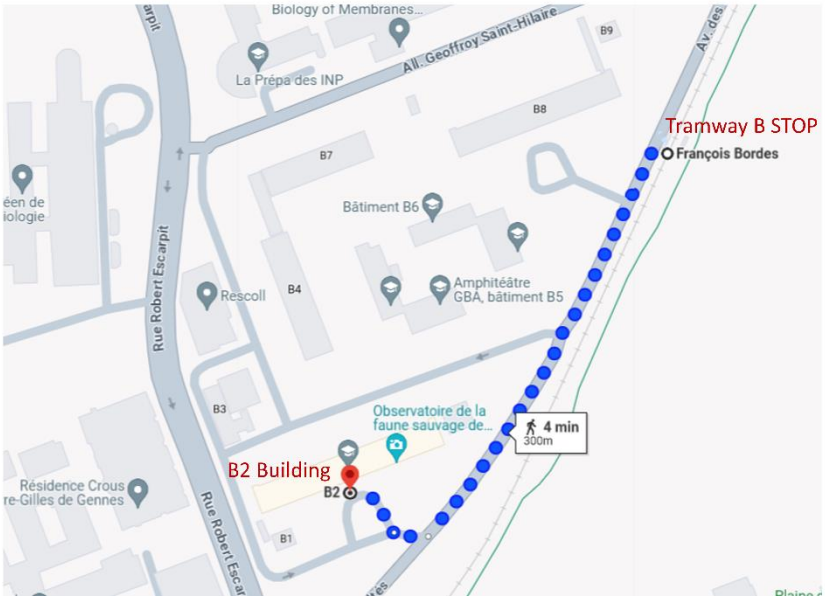
|---|---|---|
| 16.00 – 16.30 | Coffee break | |
| 16.30 – 18.00 | Discussion | Final discussion |

**Practicalities**

## Venue

The workshop will be held at the University of Bordeaux located at Avenue Geoffroy Saint-Hilaire, Bât. B2, ground floor, tramway stop "François Bordas" of Tram B.

The cost of the accommodation and travel will be funded by each partner project. The lunch of both days will be covered by the SUPERB project.




## Accommodation

We recommend to book your hotel downtown in Bordeaux or close to the University (Talence), the university has an easy access by tramway. For example:

Bordeaux: https://www.victoriagarden.com/destination/appart-hotel-bordeaux-centre/#appart

Talence: http://www.teneoapparthoteltalence.com/

## Travel

There is direct tramway from the airport Bordeaux-Mérignac and from the train station "Gare Saint Jean" to the city center and to the University. Tramway ticket is 1.70 Euros and tickets can be bought at the ticket machines located at the tramway stops.

**On line**

Although we would prefer to have you all here during these two days, we know that attending the workshop can not be possible for some of you (please prevent as soon as possible if that is the case and you haven't done it yet). This is the link to connect by videconference: https://inrae-fr.zoom.us/j/8336747515

**Funding**

This workshop is funded by three H2020 EU projects: OPTFORESTS, SUPERB and WILDE