

PROJECT CONTEXT AND OBJECTIVES

The various research projects that have been set up have shown a vulnerability of the main French forest species to global climate change.

Managers, particularly aware of these issues and the importance of choosing the right species to plant, feel especially powerless to make such heavy decisions alone, which have major consequences for the future of the forestry sector.

They are waiting for recommendations, and it has become urgent to be able to offer them options. The ESPERENSE project, building on the results of the VALORES0 1 (2012) and VALORES0 2 (2015) projects, relies on pooling resources from research bodies, public and private R&D, and managers to initiate a network of multi-partner experiments. The goal of this project will be to improve knowledge about the behavior of new species and provenances in different forest site contexts.

This unique collaborative approach, which involves researchers and managers, will allow the integration of initiatives as the project progresses and ensure a more effective and rapid feedback to forest experimenters.

PROJECT CONTENT



The project is divided into three parts:

- Laying the foundations for an experimental network for the evaluation of species and provenances (Fig. 1);
- Defining forest systems with a focus on wood production and considered vulnerable to climate change;
- Establishing a specification for setting up a multi-partner platform enabling the sharing of experimental data and metadata;
- Formalizing a multi-partner consortium around the network.



Source: Benjamin Carron - © CNPF

Figure 1: Presentation of a future Island

PROJECT CONTRIBUTION TO AFORCE THEMES



PROJECT PARTNERS

INSTRUCTIONS FOR USE

IN EXCEPTIONAL CIRCUMSTANCES, EXCEPTIONAL MOBILIZATION

In the face of climate changes and for the maintenance of wood production, the use of species better adapted to future climates will become a necessity.

To address this necessity, it is urgent to evaluate, under national soil and climate conditions (both present and future), the potential adaptive capacities and the relevance of new species.

The urgency and scope of this evaluation are such that a pooling of experimentation involving all relevant stakeholders is essential in order to have a multiplying effect. This multiplication will allow us not only to obtain robust scientific and technical results but also to acquire shared knowledge to better understand these new species.

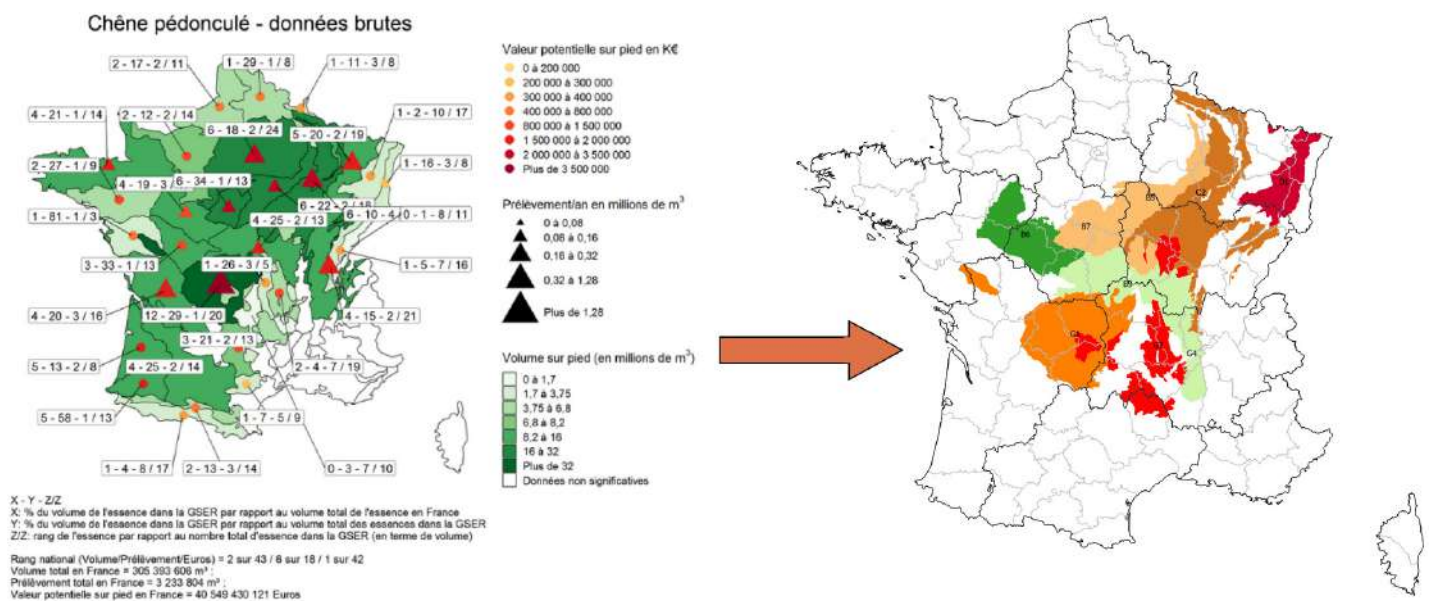
SETTING UP EXPERIMENTS, BUT WHERE?

The objective is the maintenance of a wood-producing forest, wood being a renewable raw material that also has a significant capacity to mitigate climate change through the sequestration of atmospheric carbon.

Forest areas combining production stakes and vulnerability to climate change have been identified through the analysis of IFN data and the sensitivity of species to climatic stresses.

The example (Fig. 2) illustrates the transition from production zones to examples of priority areas.

The ESPERENSE network focuses on priority zones of species, which can be either national or regional. The goal is to determine alternatives to endangered species based on the territories.



SETTING UP EXPERIMENTS, BUT HOW?

A shared network of experiments requires that everyone can get involved according to their skills, resources, and expertise. With a decreasing complexity of implementation and monitoring, three types of experimentation (Fig. 3) are selected.

1 - Elimination trial

- **Selecting** species from a large pool
- R&D organizations
- **Adaptation trial**

2 - Behavioral trial

- **Evaluating** the behavior of a few tree species
- Development Organizations
- **Station / production trial**

3 - «Îlot d'Avenir» Trial

- **Mastering** a new species
- Managers
- **Management trial**

Figure 3: Characteristics of the three types of trials (elimination trial, behavioral trial, and «îlot d'avenir» trial).

In order to optimize these assessments and anticipate future climate, identical trials will be established within the Network, with one site in the current climate within the area of interest and one site in a future climate analogue representing the tomorrow's climate of the area of interest.

On the map (Fig. 4), an area of interest is shown in red and the climate analogue of the red area of interest for a future 2050 scenario is shown in blue.

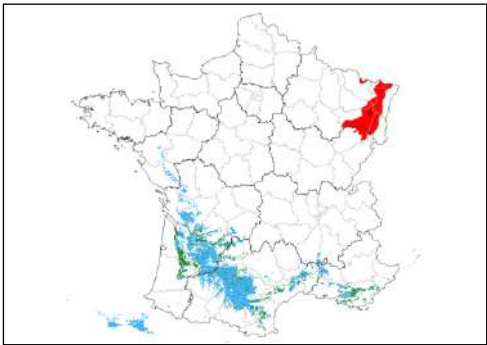


Figure 4: Example of a site in a zone with current climate issues and of a site in a future climate analogue.

IMPLEMENT EXPERIMENTS, BUT WITH WHICH SPECIES?

Lists of species are proposed based on the species-related challenges. More than 100 species have been selected: they would potentially be of interest to ensure a production function in the context of climate change, which involves a higher risk of summer water stress and heat than currently.

Each species is assigned a status based on the available knowledge about it and its presence in the national territory through known trials. The six selected statuses, in order of increasing knowledge, are: candidate (0, 1, and 2) and suitable (1, 2, and 3).

Taxon	Nom vernaculaire	Statut
<i>Abies cephalonica</i>	Sapin de Céphalonie	Apte 1
<i>Calocedrus decurrens</i>	Calocèdre, cèdre à encens	Candidate 2
<i>Cedrus atlantica</i>	Cèdre de l'Atlas	Apte 2
<i>Quercus frainetii</i>	Chêne de Hongrie	Candidate 1
<i>Quercus petraea</i>	Chêne sessile	Apte 3
<i>Quercus vulcania</i>	Chêne de Turquie	Candidate 0

Figure 5: Example of species that are offered and their associated statuses

SET UP EXPERIMENTS AND MONITOR THEM

For each test, a protocol for implementation and monitoring was drawn up. It is important to follow the recommendations made therein in order to acquire reliable and consistent data on survival and growth.

The pooling of data obtained from the different sites of the network will allow for robust analyses that should lead to the development of technical knowledge on new species necessary for everyone.

ORGANIZATION AND GOVERNANCE OF THE ESPERENSE NETWORK

To organize the network, a consortium agreement is signed by the network participants. This consortium will be made up of founding members and associated members, all of whom are experimenters. This agreement outlines how the network will operate and be governed, and specifically includes the requirements to be met for integrating an experiment into the network. Finally, an online platform will be set up to provide information on the projects and results, as well as to manage the logistics of making plant material available.

KEY LESSONS

Trials should be installed primarily in areas considered as «priority zones» and in areas similar to the future climate of the priority zone.

A zone is considered «priority» when the existing stands have a production value and are subject to vulnerability to climate change.

The network proposes three types of experimental setups, framed by standardized protocols, which will ultimately allow for effective sharing of experimental results.

A classification is established to define the list of genetic units (GUs) to be tested in these different zones.

These GUs are categorized based on their suitability to potentially replace the existing species in critical situations. Experimenters will have, for each zone, a list of GUs to test.

TARGET AUDIENCE AND PURPOSE OF THE PROJECT

Difficulty in appropriation: ● LOW ● MEDIUM ● HIGH This objective does not apply to this audience: ○

OBJECTIVE TARGET AUDIENCE	Management Tools and recommendations	Research and development Tools and content creation	Education Knowledge acquisition
Forest owners	●	○	●
Technical forestry staff	●	○	●
Research and development practitioners	○	●	●
Higher education students	○	●	●
Technical education Students	●	○	●

The formalization of a consortium as well as the establishment of a multi-partner exchange platform on tree species (tools, logistics, procedures, data sharing) will benefit all the actors involved. The results from the trials will help to feed the knowledge and **work of research actors**, which, in the long term, will contribute to the development of recommendations for **forestry management professionals**.

TEAM

Initially, the project coordination was carried out by Ms. Céline Perrier (CNPf-IDF) and the facilitation by Mr. Hedi Kebli (CNPf-IDF).
The coordinators of the ESPERENSE network are Mr. Eric Paillassa (CNPf-IDF) and Ms. Brigitte Musch (ONF-UMR BioForA).

In order to organize the ESPERENSE network, a consortium agreement is signed by the stakeholders.

FOR MORE INFORMATION

More information is available on the [ESPERENSE project page](#) of the RMT AFORCE.

More information on the VALORES0 1 and 2 projects is available by clicking [here](#).

The thematic conference «Experimentation in the Service of the Forest of Tomorrow» held on May 26, 2021, is available for replay on our website by [clicking here](#).

PROJECT FUNDERS