Santander Fundación

C.R.E.A. and Fundación Banco Santander save the four-leaf clover and dwarf oak from extinction

- The project of Fundación Banco Santander and the Félix Rodríguez de la Fuente Centre for the Reproduction of Endangered Species (C.R.E.A.) safeguards plant heritage of global interest.
- On the verge of extinction, Quercus lusitanica (dwarf oak) and Marsilea quadrifolia (water fern) only survive in small areas in the Ukraine, France, Cadiz and La Coruña.
- The C.R.E.A. is the only centre in Europe dedicated to the protection and care of these unique species in captivity.

Madrid, October 17, 2018-

Antonio Estévez, director of the **Center for the Reproduction of Endangered Species** (C.R.E.A. Félix Rodríguez de la Fuente) and Rafael Hurtado, environmental advisor to **Fundación Banco Santander**, will present this unique project in which they have been working together since 2015 to help conserve two unique Iberian plant species in extreme danger of extinction. The **Mayoress of Allariz**, Cristina Cid, and the **Deputy Mayor of Orense**, José Araújo, will participate in the event and will be joined by the **Vice-Chancellor of the Orense campus of the University of Vigo**, Esther de Blas.

Marsilea quadrifolia (water fern with its four-leaf clover leaves) is a European endemism that grows in widely dispersed and sparse populations in the Ukraine, France and Spain, which gives an idea of the worldwide importance of this species. According to data from the Ministry of the Environment, its last living natural population in Spain is found in the Félix Rodríguez de la Fuente C.R.E.A.

As for Quercus lusitanica, it is one of the most threatened woody species in our country and is currently only found in some areas of La Coruña and Cadiz. The delicate situation that these species are going through has made it possible to raise awareness in both the private and public spheres, as their disappearance would lead to a loss of irreplaceable plant heritage.

According to **Antonio Estévez**, director of the C.R.E.A., what we have tried to do is "ensure the natural viability, spatial persistence, scientific dissemination and genetic variability of two of the species with the highest degree of threat to Spanish flora".

In the opinion of **Rafael Hurtado**, environmental advisor to the Banco Santander Foundation,

this recovery arises from "the fruitful conjunction of science, technology and quasi-craftwork, to achieve a combination of the classic and the innovative in the processes of preservation of natural heritage" which is often replicated elsewhere.

The fact is that the rate of species extinction in the world has accelerated with human activity, until it was about a **thousand times higher than in the 60 million** years before our existence. This reinforces the urgency of conserving the remaining heritage DNA and reducing our impact. The "normal background rate" on the planet is estimated at 0.1 extinctions per million species per year. The current extinction rate is more than 100 extinctions per million species per year.

Either because of their current delicate situation (low number, reduced genetic variability...) or because of their restricted habitat, animal and plant endemics have an extra risk of disappearing compared to other species, which is estimated to be 6% higher. Their net exclusivity and geographic restriction makes them immensely more fragile and unrecoverable.

Methodology and lines of action

On-site conservation

A set of management measures has been adopted to protect existing natural populations of both species, taking into account the limitation of urban development, the protection of aquifers near or involved in the areas of occupation of the threatened species and selective and preventive clearing to neutralize the effects of possible forest fires. An important part of this preservation project has been to raise public awareness through environmental education.

Ex-situ conservation

A glazed and totally conditioned greenhouse has been built, in which soil of the same typology as the one existing in the original population of Quercus lusitanica in Galicia was supplied as a substrate, intuiting the existence of symbiotic relationships of mycorrhizae which were essential in the germination process and the subsequent cultivation of the collected seeds.

The culture cells of Marsilea quadrifolia were implanted and grown in two big constructions made of stainless steel and rustic stone, thermally isolated and closed with electro-welded meshes. This project has been a overall complete success.

Inter-situ conservation

Currently, the inter-situ option is a good asset for conservation and biodiversity. Targeting semi-natural areas to protect highly threatened species is undoubtedly the smartest, most efficient, most effective, cheapest, most convenient and, in almost all cases, most successful alternative of all those that can be addressed. From this point of view, an enclosure has been built where various specimens of Quercus lusitanica born in the aforementioned ex situ greenhouse prosper, thanks to the application of an exclusive structural technique discovered during the course of this project. Furthermore, Marsilea quadrifolia was successfully introduced for the first time in Spain in the town of Allariz (Orense). A small lagoon was created in this municipality for this purpose and its population has been optimally maintained for more than two years.

Intra-situ conservation

Ecological terminology used for the first time in this text, as a result of successfully implanting two strains of Quercus lusitanica in the same wild plot of land in the C.R.E.A. (also born in the same Centre). The objective is to achieve the formation of a real "stand" of this species so that it grows, in an absolutely natural way, only 150 kilometers from its original population and a few meters from the environment that occupies the only natural population of Marsilea quadrifolia in Spain.

Preventive multi-location security

In order to achieve the indefinite conservation of these two species, and due to their enormous scientific interest and high potential as a tool for environmental education, until the time of writing this brochure, the following entities have they have been interested in officially participating with the introduction, manufacturing of facilities and joining forces with this project: Educación Ambiental y Colección de Clones de Árboles Singulares de España - Pozuelo de Alarcón City Council, Madrid. *Allariz City Council, Ourense. *Germplasm Bank of Córdoba. *Centro de Investigaciones Forestales de Lourizán - Xunta de Galicia, Pontevedra. *Ramon Gonzalez Ferreiro Foundation, Ourense. *GREFA, Madrid. *Botanical Garden of Cordoba. *Botanical Garden El Robledo - Environmental Agency of the Andalusian Government, Seville. *Royal Botanical Garden - CSIC, Madrid.

About Fundación Banco Santander

At Fundación Banco Santander we work to contribute to the construction of a more equitable, inclusive and sustainable society.

With this objective, we develop initiatives grouped into three lines of action: the promotion of culture as a tool for understanding the world around us, social action to facilitate the progress of vulnerable groups and care of the environment to protect natural heritage.

In all our programmes we strive to create networks of collaboration with the third sector in order to face the main global challenges together.