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LIFE RENAIX EL BOSC

USING SPECIES DISTRIBUTION MODELLING FOR THE RESTORATION OF RAVINE FORESTS (*TILIO-ACERION*) IN THE EASTERN END OF THE IBERIAN MOUNTAIN SYSTEM

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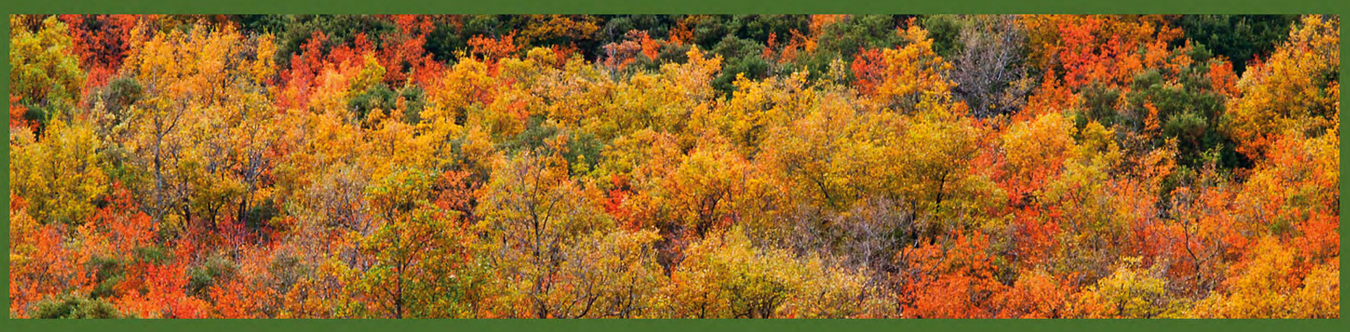

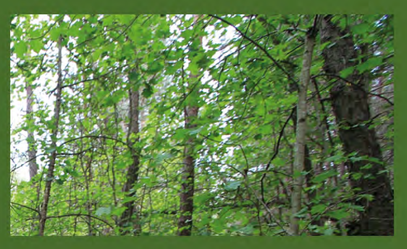

Figure 1 project area

INTRODUCTION

One of the biggest issues that managers have to deal with when restoring endangered habitats that offer very scarce reference scenarios is the site selection process. Choosing the right places to create new populations is critical, especially when humans have been intensively using the existing forests of that area over centuries. Species Distribution Modelling (SMD) has been proved a reliable tool to determine suitable locations for species reintroductions by correlating species occurrence data with environmental variables (Austin, 2007). This paper presents the findings of a study developed under the LIFE+ project “Renaix el Bosc” (LIFE11 NAT ES 706). The project is devoted to the restoration of the NATURA 2000 priority habitat of Tilio-Acerion forests of slopes, screes and ravines, which is represented in Valencian territory by small and rare forest fragments distributed among the Maestrat and Els Ports mountains in Castellón, Spain.

MATERIAL AND METHODS

To support and improve the selection process of the new sites, a SMD has been applied to generate maps of occurrence of two selected species that could be good habitat's distribution predictors. The species chosen are *Tilia platyphyllos*, the broad-leaved lime tree, which has a very restricted distribution and is indeed listed as vulnerable in the Anex I of the Valencian Catalogue of threatened flora species, and *Ilex aquifolium*, a species that shows a wider distribution and doesn’t have any conservation problem in that area. The species distribution information was obtained thorugh the inventory of all known *Tilio Acerion* spots in the area that was developed by this project and also form the regional biodiversity data base that is managed by the regional environmental administration. This work used for its analysis the general-purpose machine learning method MaxEnt (Maximum Entropy) and presence-only species occurrence data (Philipps et al. 2006). The environmental data was aquired from the Atlas Digital de la Península Ibérica (Ninyerola et al. 2005). 18 variables where used in raster format with a 200 m cell size. These where: precipitation in autumn, summer wet period, summer dry period and spring, temperature maxima in summer and the warmest month (June), radiation in summer, winter and annual means, temperature minima in winter, spring and summer, elevation, slope and orientation. The model was run 15 times and the results averaged.

RESULTS AND DISCUSSION

Runing the model with both species delivered similar and expectable results. Its distribution seems to be limited mainly by the maximum summer temperatures, which are, in turn, influenced by altitude above sea level. The maximum temperatures in June explain nearly 50 % of the results for *Ilex aquifolium* and 36 % for *Tilia platyphyllos*. Other variables that played an important role where the summer precipitations. This is quite logical since the Tilio-Acerion habitat isn’t adapted to the Mediterranean summer dryness and its occurrence is restricted to the places where the tipical Mediterranean summer conditions are less pronounced.

In the figures 2 and 3 the average presence probabilities for both species can be seen. The project locations are also displayed, showing that must of them fall inside of the suitable area for the development of the Tilio-Acerion habitat.

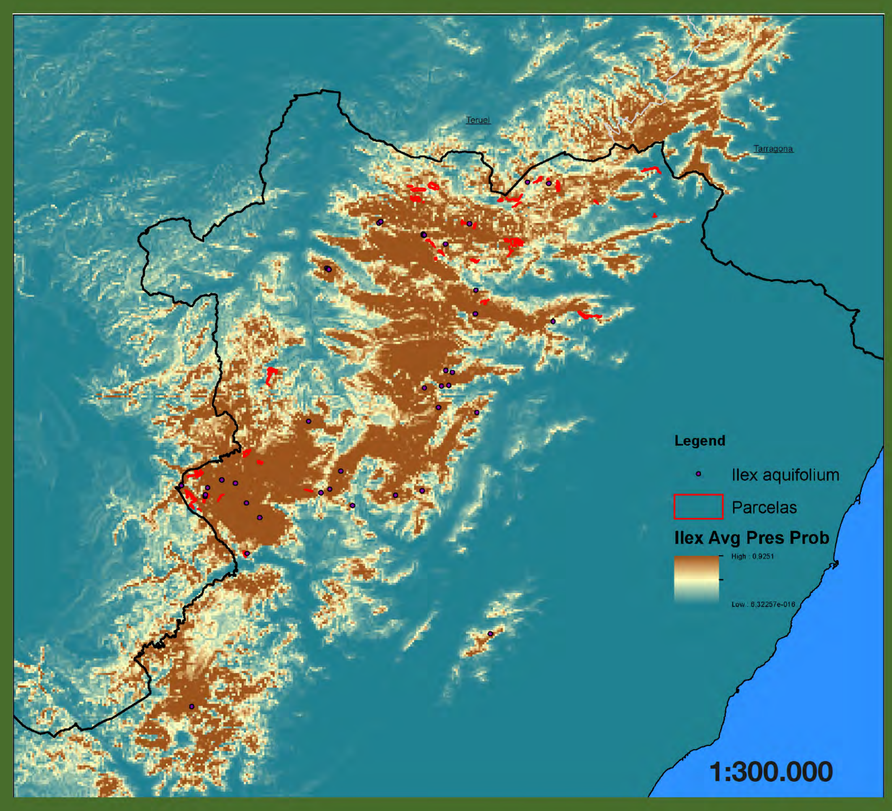

Figure 2 Estimated Presence probablity for *Ilex aquifolium*

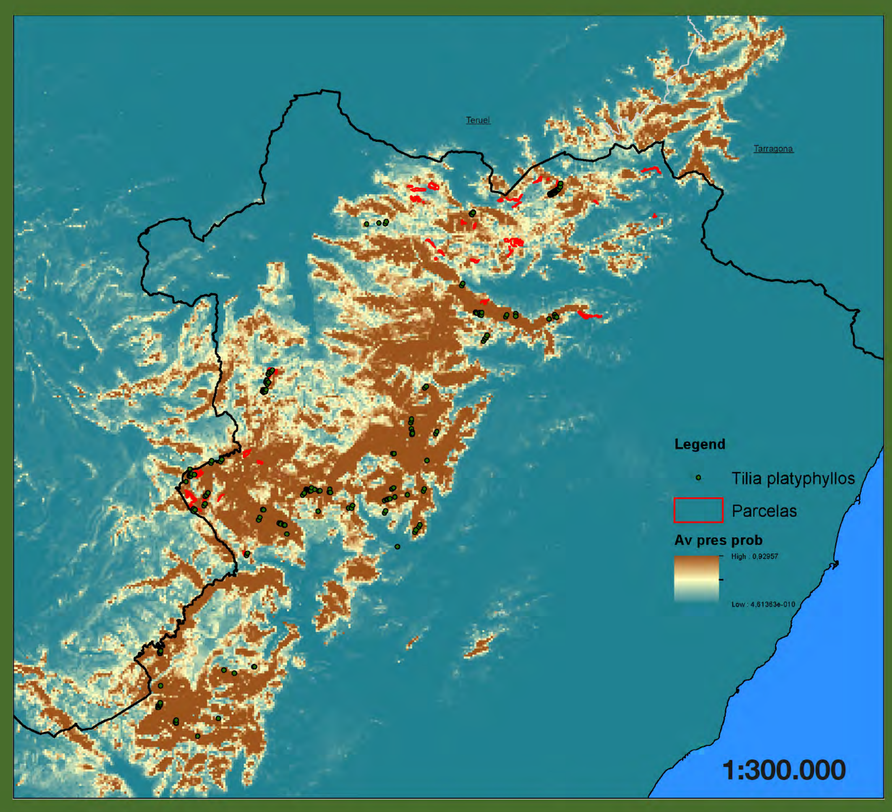

Figure 3 Estimated Presence probablity for *Tilia platyphyllos*

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