**FOREST CONNECTIVITY RESTORATION THROUGH REFORESTATION**

**AN INTEGRATED METHODOLOGY FOR PRIORITIZING AGRICULTURAL LANDS AND SELECTING REFORESTATION SPECIES**

*Technical University of Madrid, ECOGESFOR research group, Madrid, Spain*

*Technical University of Madrid, Department of Forest Management and Economics, ETSI Montes, Madrid, Spain*

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**OBJECTIVES**

Provide land planners and managers effective tools and methodologies...

1. To identify in advance those landscapes where connectivity should be really treated as a critical concern for the conservation goals.
2. To optimize the reforestation of agricultural patches in order to favor the enhancement of forest connectivity.
3. To make a more reliable selection of reforestation species.

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**STEP 1**

**Quantify forest connectivity within landscape units**

- Discriminate and map the landscape types according to abiotic and biotic variables (García-Feced et al., 2008).
- Use the software Conefor Sensinode 2.2 (Saura and Torné, 2009; available at [http://www.conefor.org](http://www.conefor.org)), a powerful tool for analyzing potential landscape connectivity, to calculate within each landscape unit the Integral Index of Connectivity (IIC; Pascual-Hortal and Saura, 2006) at a specified dispersal distance (as an example, the dispersal distance of the figures is 1000 m).

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**STEP 2**

**Identify priority agricultural patches for reforestation in order to enhance forest connectivity within the landscape units**

- Calculate the increase of IIC (dIIC) that would result from the conversion of each agricultural patch into a forest (García-Feced et al., 2011).
- Classify dIIC values into five categories using natural breaks of the whole district values in order to prioritize patches for reforestation.

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**STEP 3**

**Identify suitable tree species and order them by probability of occurrence**

- Estimate occurrence probability of each tree species within the priority patches for reforestation using:
  - Ecological niche models fitted with penalized logistic regression (Gastón & García-Viñas, 2011).
  - Native tree species distribution data from the Spanish Forest Map as response variable and climatic and lithological variables as predictors.

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**CONCLUSIONS**

The major outputs of this combined methodology are: 1) A map of the agricultural patches that would contribute most to uphold forest connectivity if they were reforested. 2) A list of suitable tree species for those patches ordered by occurrence probability. Therefore this methodology may be useful for suitable and efficient forest planning and landscape designing.

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**REFERENCES**


GARCÍA-FECED C., GONZÁLEZ-ÁVILA S., ELENA-ROSSELLÓ R., 2008. Metodología para la tipificación y caracterización estructural de paisajes en comarcas forestales de España, Forest Systems (Formerly Invest Agrar: Sist Recur For) 17, 130-142. [In Spanish].

