



PHOTO GALLERY

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The Weight of the Past

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In order to understand the importance of past land use and current ecological factors relating to oak regeneration within pine plantations, we hypothesized that native forest regeneration within plantations depends largely on in situ biological legacies as a source of propagules. We analyzed native oak regeneration in 168 pine plantation plots within the Sierra Nevada (southern Spain) in relation to land use type in 1956, oak patch proximity, and pine tree density. Historical land use patterns were determined from 1956 aerial photographs, and these were compared to 2004–2005 inventory data and additional orthophoto images.



Photo I. Aerial photograph of an area of the Sierra Nevada mountains (southern Spain) in 1956 (top) and 2001 (bottom). During the period 1950–1980, many heavily overharvested agricultural lands were abandoned, and were then converted to pine plantations. Photo credit: A. J. Pérez-Luque, obtained from Ortophotos (Andalusian regional government).



Photo 2. (a) Dense pine plantations in Sierra Nevada Mountains (southern Spain). These forest plantations are usually characterized by higher stand density and lower tree diversity. (b) Within these forests we find recruits of native oak *Quercus ilex* ssp. *ballota* (Desf.) Samp. (c) The number of *Q. ilex* recruits per sampled area (estimated from a forest inventory carried out in 2005) were used as the oak regeneration variable in the study. Photo credit: A. J. Pérez-Luque.

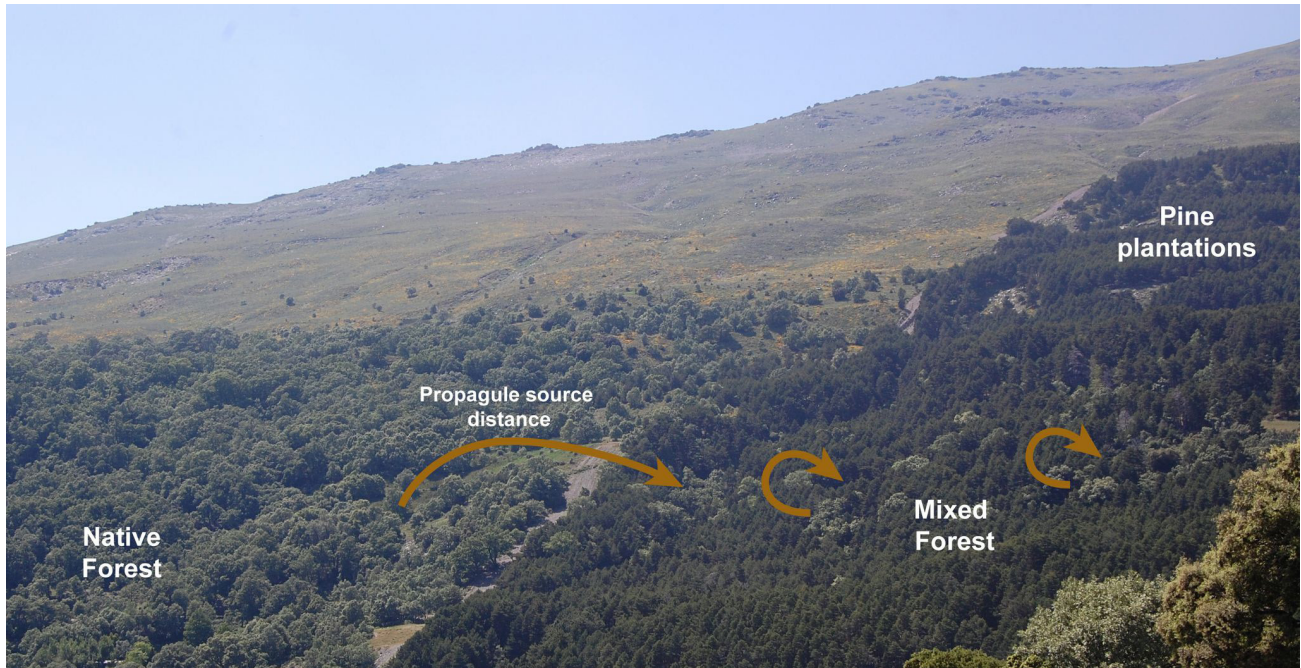


Photo 3. The oak recruitment in the pine plantations also depends on the dispersion distance from native forest. In this photo we show a native forest patch acting as a source of oak propagules for an adjacent pine plantation. Photo credit: A. J. Pérez-Luque.

These photographs illustrate the article “The weight of the past: land-use legacies and re-colonization of pine plantations by oak trees” by Irene Navarro-González, Antonio J. Pérez-Luque, Francisco J. Bonet, and Regino Zamora, published in *Ecological Applications* 23(6): 1267–1276, September 2013. <http://dx.doi.org/10.1890/12-0459.1>