

*Nature's contributions to people provided by spontaneous forest regrowth*

Irene Martín-Forés, Sandra Magro, Andrés Bravo-Oviedo, Raquel Alfaro-Sánchez, Josep M. Espelta, Theresa Frei, Elena Valdés-Correcher, Carmen Rodríguez Fernández-Blanco, Georg Winkel, Gabriel Gerzabek, Santiago C. González-Martínez, Arndt Hampe & Fernando Valladares

The spontaneous regrowth of forest vegetation can provide a low-cost and efficient opportunity to enhance the contributions that nature provides to people in diverse landscapes, especially when the social context is properly considered.

European forest cover has considerably increased over past decades as a consequence of widespread farmland abandonment and rural exodus. This transition from a net loss to a net increase in forest cover is being driven by both active afforestation (mostly in Central and Northern Europe) and spontaneous forest regrowth (mostly in South-Eastern and South-Western Europe). Yet, little is known about the contributions (goods and services) that novel forests spontaneously established on abandoned lands provide to people.

We assessed diverse goods and services (using the recent term Nature's contributions to people) arising from spontaneous forest regrowth in four South-West European landscapes with contrasting ecological and societal contexts. Two landscapes are located in rural areas undergoing human exodus and the other two in peri-urban areas with intense land use. We estimated changes in terms of different Nature's contributions to people, including material (energy and genetic resources), regulating (habitat creation, pollination, climate regulation, and biological processes), and non-material (learning and inspiration, physical and psychological experiences, and supporting identities) as well as biodiversity as a combination of all classes.

We found that spontaneous forest regrowth implied greater climate regulation and energy provision, while its role for non-material contributions was strongly context-dependent. The social perception of spontaneous forest regrowth

was primarily negative in rural areas and more positive in peri-urban landscapes. Different social perceptions of competing land uses need to be carefully addressed in order to enhance forest multifunctionality and sustainability. In this sense, adaptive management practices integrating local knowledge and perceptions could optimise the contributions provided from naturally regrowing forest to society, especially in rural populations where traditional farming activities are considered an important part of their heritage. Properly integrated with other needs, spontaneous forest regrowth offers an opportunity to restore ecosystem functioning and to increase Nature's contributions to people, while helping to achieve environmental policy goals.



*A Juniperus thurifera forest that is spontaneously regrowing towards abandoned adjacent old-fields in a rural and remote area of central Spain. Photo credit: Dr. Irene Martín-Forés.*

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