



FOREST FACTS



Spain. Photo: Pablo Garrido



Spain. Photo: Pablo Garrido

Sweden. Photo: Micke Angelstam



Spain. Photo: Pablo Garrido

Swedish and Spanish wood-pasture ecosystem services —A cross-site comparison of stakeholder perspectives

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Wood-pastures are cultural landscapes of outstanding importance for biodiversity and human wellbeing. However, they are currently threatened by multiple factors.

In both Sweden and Spain the **portfolio of ecosystem services differed** between stakeholders representing local level (more provisioning) and regional level (more cultural).

There were clear **differences in how respondents in the two countries perceived ecosystem services**. Spanish stakeholder reported 45 ecosystem services and Swedish 34. The former mentioned primary production, natural hazard regulation, soil erosion, and traditional knowledge, while Swedes did not.

Supporting and cultural services were highly valued in both countries, suggesting a key role of these services in wood-pasture management and conservation.

Stakeholders in both countries expressed similar challenges in terms of hard working conditions, marginal profitability, and land abandonment linked to gradual socio-economic transition.

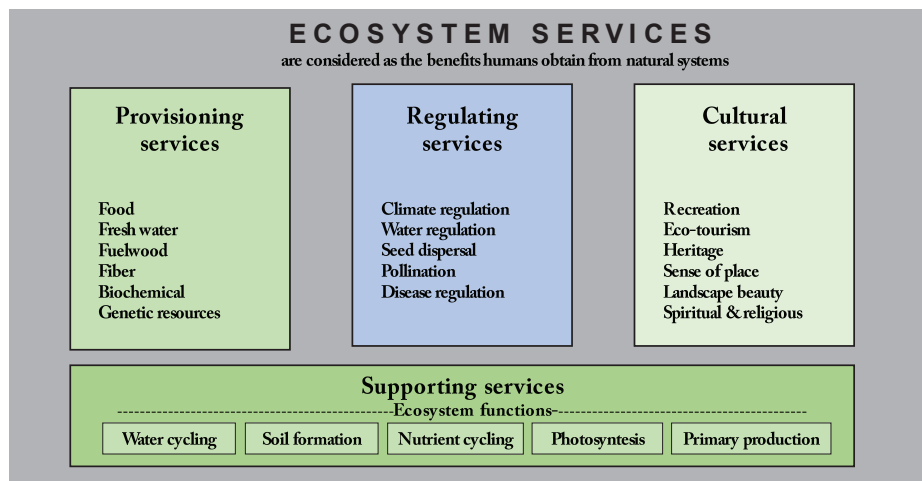
Cross-site comparisons facilitate mutual learning processes around multifunctional land management.

Wood-pastures combine scattered trees, grasslands and grazing animals. They have been and are part of European cultural landscapes, occur in most regions in Europe, and cover 203 000 km². These landscapes have, however, declined due to land use change including both intensification and abandonment of agriculture. We compared oak wood-pastures in Sweden (“*eklandskap*”) and Spain (“*dehesa*”) that are protected by the Habitat Directive of the EU. We applied a standardized research design based on 63 semi-structured interviews with stakeholders at local and regional level of governance. The aim was to map the full range of

Swedish and Spanish wood-pasture ecosystem services

A cross-site comparison of stakeholder perspectives

Box 1. Ecosystem services framework applied in Swedish and Spanish study areas. Figure adapted from Millennium Ecosystem Assessment 2005.



ecosystem services (see Box 1) as perceived by stakeholders, and to compare their perceptions among stakeholders from different sectors and levels of governance in Sweden and Spain.

Swedish and Spanish wood-pastures

In Sweden, wood-pastures were traditionally important habitats for livelihoods of rural people, and were used for animal husbandry and hay-making. Today wood-pastures are valuable habitats for many red-listed saproxylic beetles, butterflies and lichen species that are associated to old sun-exposed oak trees. However, these habitats are severely fragmented, and threatened by the abandonment of traditional land management practices. The best preserved oak wood-pastures in Sweden occur in Östergötland County where they cover around 180 km² as scattered small patches (Figure 1).

In Spain the wood-pasture landscape (“*dehesa*”) was used as an agro-silvo-pastoral system for centuries. It has a

mosaic structure with a diversity of habitats which hosts specialised and endangered species. Traditional management practices were abandoned in the 1960s, leading to a simplification of land uses. Yet, very large areas remain covered by oak wood-pastures in the Iberian Peninsula, where the province of Cáceres is at the center of the range of the *dehesas* (Figure 1).

Diverse ecosystem services

Local level respondents – Cultural services were the most commonly perceived ecosystem services in Sweden while provisioning services were highlighted the most in Spain (Figure 2a,b). Among cultural services, stakeholders from both regions acknowledged recreation and eco-tourism services associated with wood-pastures. Additionally, cultural landscape and land-scape beauty were identified as important in Sweden, whereas in Spain respondents additionally highlighted traditional knowledge and heritage values.

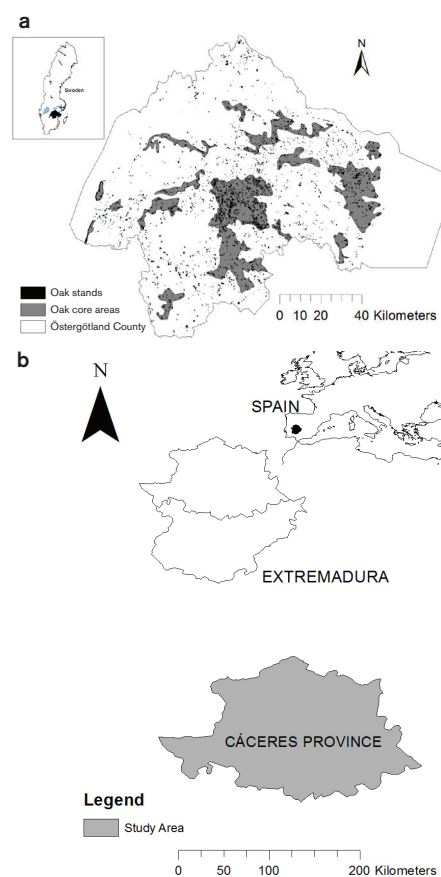


Figure 1. The location of both study areas: (a) Östergötland County in Sweden where total cover of oak wood-pastures with high natural values equals 180 km²; and (b) Cáceres province in Spain where the total forest and woodland area equals 16 000 km² of which 77.3 % (12 370 km²) correspond to *dehesas*.

Provisioning services included fodder from pastures and meat from livestock, and to a lesser extent timber and crop products in Sweden. In Spain, livestock and pastures were the most mentioned provisioning services, followed by fodder from trees, firewood, charcoal, wild game and many other sub-products such as cheese, olive oil, sausages, and wine.

The ecosystem services most mentioned at local level in Sweden and Spain. 1. Landscape beauty (Sweden; Micke Angelstam). 2. Cultural landscape (Sweden; Micke Angelstam). 3. Traditional knowledge and practices (Spain; Pablo Garrido). 4. Landscape beauty (Spain; Micke Angelstam).



Regarding supporting services, both Swedish and Spanish respondents appreciated biodiversity. In Spain, respondents also acknowledged water cycling, nutrient cycling and photosynthesis.

Regulating services were rarely expressed by stakeholders in Sweden (Figure 2a); the only two services mentioned were noise regulation and water regulation and purification. The variety of services perceived by Spanish respondents was much greater, and natural hazard regulation was the most frequently acknowledged. Seed dispersal, erosion regulation and climate regulation were also mentioned.

Regional level respondents – Swedish and Spanish respondents valued cultural services the most (Figure 2a,b). Swedes mostly mentioned recreation and eco-tourism services, landscape beauty and education and knowledge. Spaniards appreciated most frequently education and knowledge services, traditional knowledge, cultural landscape and recreation and eco-tourism services.

Biodiversity, and particularly species richness, as supporting services was highlighted both by Swedish and Spanish respondents at the regional level (Figure 2a,b); as well as primary production services in Spain.

Provisioning services were rarely mentioned by Swedish respondents, with timber, fodder and crops being equally named. In contrast, livestock was acknowledged the most, followed by fodder and other services mentioned to much lesser extent by regional level Spanish respondents.

Surprisingly, regulating services were not mentioned by any Swedish respondent at regional level (Figure 2a), whereas Spanish

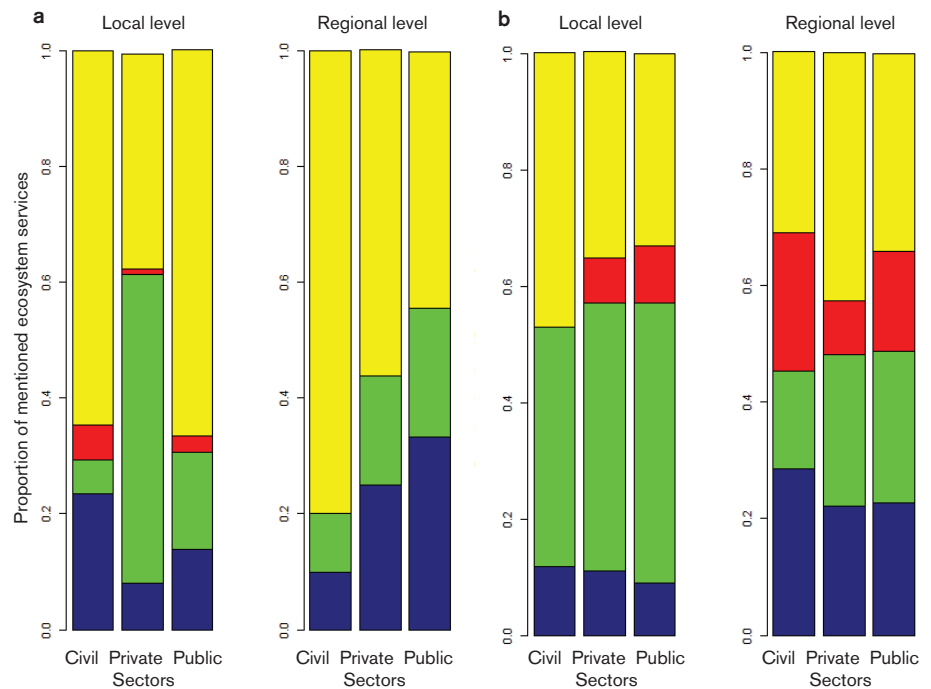


Figure 2. a) Ecosystem services from oak wood-pastures mentioned by stakeholders from civil, private and public sectors at local and regional level in Östergötland County (Sweden). b) Ecosystem services from *dehesa* wood-pastures mentioned by stakeholders from civil, private and public sectors at local and regional level in Cáceres province (Spain). Yellow – cultural, red – regulating, green – provisioning, blue – supporting.

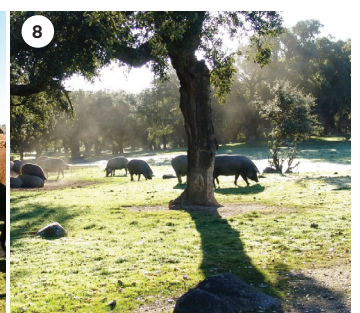
respondents acknowledged all services but noise regulation; climate regulation, water regulation and purification and natural hazard regulation appeared most frequently.

Current challenges and implications

Throughout Europe the importance of wood-pasture landscapes has been recognized. However, they are still affected by changing socio-economic processes, and are commonly becoming degraded and fragmented. Current threats such as urban sprawl, land abandonment and agricultural

intensification entail even greater uncertainty for the long term conservation of valuable wood-pasture landscapes in Europe. In Sweden, oak wood-pastures are deteriorating due to (1) land abandonment and the absence of livestock, (2) active transformation of agricultural land to Norway spruce plantations, and (3) habitat fragmentation. Additionally, the beauty of the landscape attracts people to live closer to wood-pastures, which promotes further fragmentation of habitats due to urbanization and grey infrastructure (i.e.,

The multi-functional character of wood-pastures. 5. Endangered Verata goat breed. Used for lamb and milk production for cheese making. Important natural agent to prevent wild fire occurrence (Spain; Pablo Garrido). 6. Endangered Berrenda cow breed. Used for meat production (Spain; Pablo Garrido). 7. Endangered black Merino sheep. Used for lamb and milk production for cheese, and wool (Spain; Pablo Garrido). 8. Iberian pigs. Used for ham and meat production. There is traditional knowledge and practices on how to prune oak trees in order to maximize acorn production and thus feed Iberian pigs, while generating fire wood, fodder and charcoal (Spain; Pablo Garrido). All these pictures also exemplify the preservation of genetic resources.





The additional current challenges of Iberian *dehesas*. 9. Regeneration failure (Spain; Pablo Garrido). 10. *La seca* oak disease (Spain; Pablo Garrido). 11. Traditional knowledge and practices abandonment; transhumance (Spain; Pablo Garrido). 12. Traditional knowledge and practices abandonment; bullfighting cattle ranching (Spain; Micke Angelstam).

road construction) development. Restoration of wood-pastures is of limited effect unless grazing regimes are maintained and oak regeneration is secured. However, such management practices are of marginal profitability today. Additional constraints are hard work conditions, lack of financial support, as well as the lack of new entrants into farming.

Both Spanish and Swedish respondents were concerned about hard working conditions, marginal profitability, and abandonment, transformation or intensification of land. Spanish respondents expressed additional concerns about the loss of traditional knowledge, excessive grazing pressure with negative consequences for tree regeneration; a disease causing

tree death (“*la seca*”); abandonment of traditional practices like transhumance (i.e., traditional seasonal migration of herds from the summer pastures in the north to the winter areas in the south of Spain), and climate change. Institutional factors were also commonly mentioned, including lack of a new specific legal framework for the *dehesa*. Today it falls under the legislation for forestry, agriculture, livestock and environment, which limits integrated management of the *dehesa* system.

Multi-stakeholder collaboration and multifunctional landscape management should be supported, as well as the incorporation of mechanisms facilitating the delivery of local products and markets. This could potentially be achieved by developing Protected Designation of Origin mechanisms. Finally, Payment schemes for Ecosystem Services could be integrated into agri-environmental schemes to compensate farmers for the production of services to society ■

”Multi-stakeholder collaboration and multifunctional landscape management should be supported...”

Keywords

Oak wood-pastures, socio-cultural valuation, social-ecological systems, ecosystem services, multipurpose management.

Read more:

► **Garrido, P., Elbakidze, M. & Angelstam, P. 2017a.** Stakeholders' perceptions on ecosystem services in Östergötland's (Sweden) threatened oak wood-pasture landscapes. *Landscape and Urban Planning* 158:96–104.
► **Garrido, P., Elbakidze, M., Angelstam, P., Plieninger, T., Pulido, F. & Moreno, G. 2017b.** Stakeholder perspectives of wood-pasture ecosystem services: A case study from Iberian *dehesas*. *Land Use Policy* 60:324–333.

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