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Forest certification in cork oak woodlands: Conservation of biodiversity and ecosystem services

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Outline:

- Forest certification: a proxy of sustainable forest management?
- Effects of forest certification on the conservation of biodiversity and ecosystem services
- Using forest certification for systematic inventorying of conservation values
- Case study: Mediterranean oak woodlands

Sustainable Forest Management

Forest ecosystems harbour more than half of all terrestrial vertebrate species and generate essential ecosystem services



... but require sustainable management to maintain biodiversity and keep delivering these services

OLPR, WWF 2014

Forest certification

- Forest Stewardship Council (FSC): 201 million ha or 4.5% of productive forests (FSC 2018)
- Program for the Endorsement of Forest Certification (PEFC) : 307 million ha (PEFC 2018) or 7% of productive forests



... a proxy of sustainable forest management?

FSC forest certification

- *Voluntary process* aiming to promote the sustainable management and *conservation of forest ecosystems*;
- Forest managers must comply with third-party audited *environmental and socio-economic management standards*;
- Comprises 10 principles and 57 *social, economic and environmental criteria of forest management*;

FSC forest certification

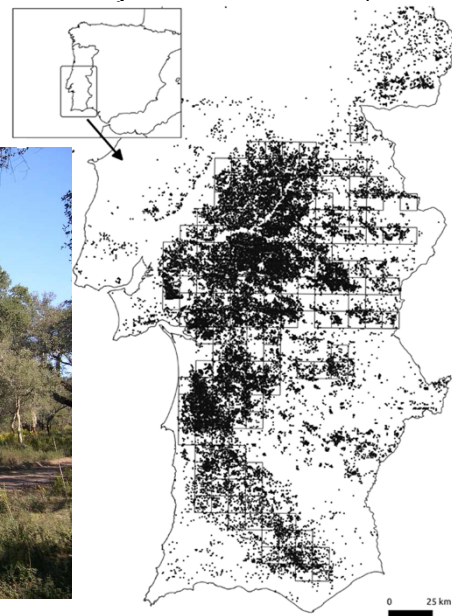
Environmental management standards:

- Principle #6 “Environmental Impact”: *Forest management shall conserve biological diversity and its associated values ...*
- Principle #9 “High Conservation Value Forests”: *Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests...*

Case-Study: Cork oak (*Quercus suber*) woodlands, southern Portugal

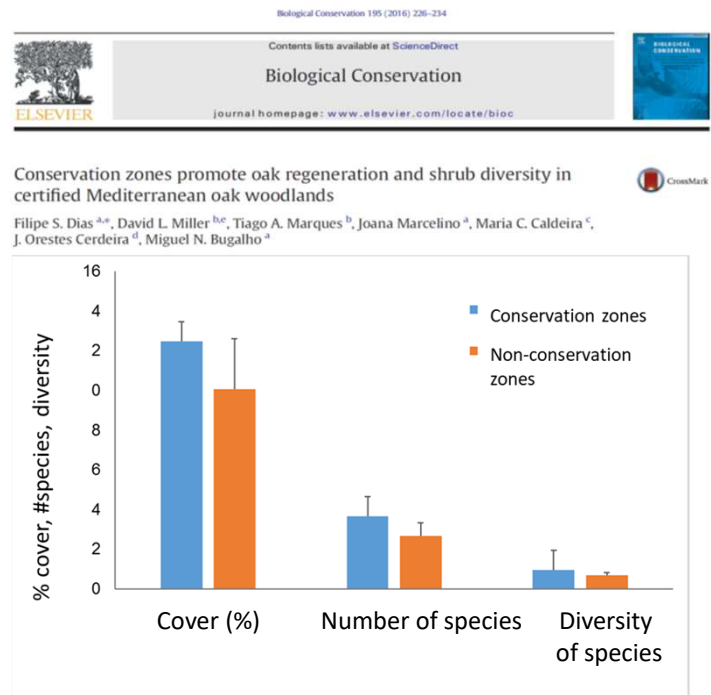
~700 thousand ha

~100 thousand ha FSC certified



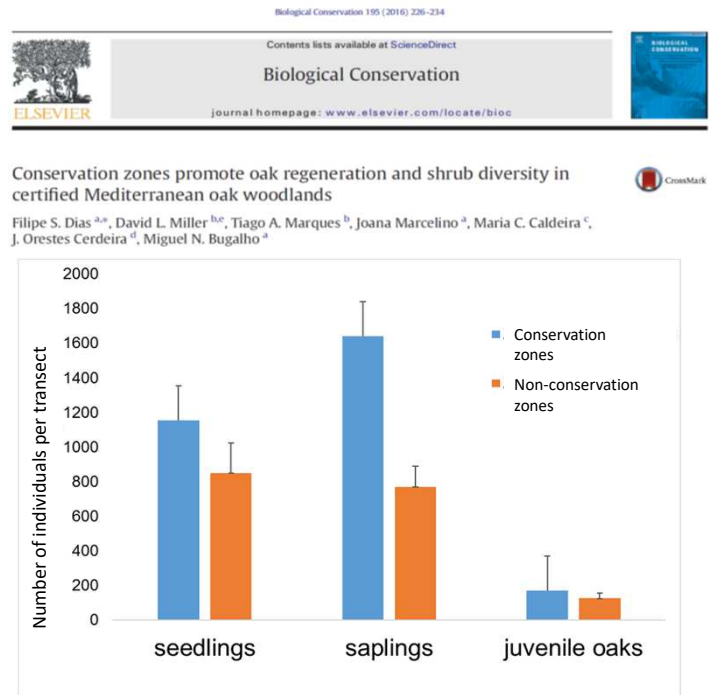
FSC Principle #6

Evidence:
positive effects on the
understorey diversity
and cover



FSC Principle #6

Evidence:
positive effects on oak
regeneration



Non-management implications: Arrested succession?

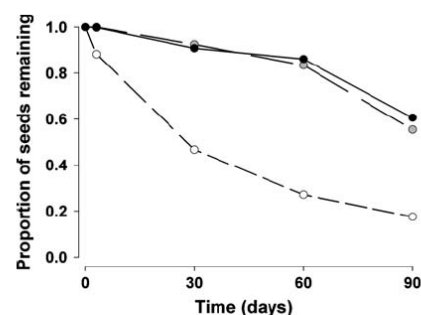
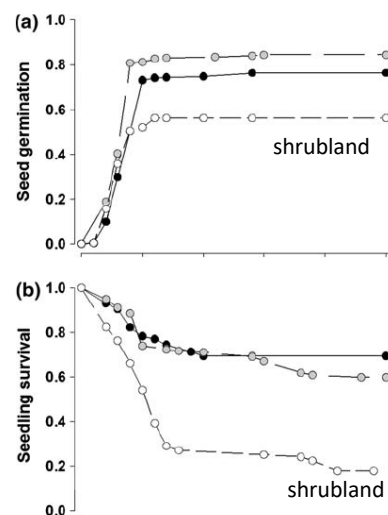
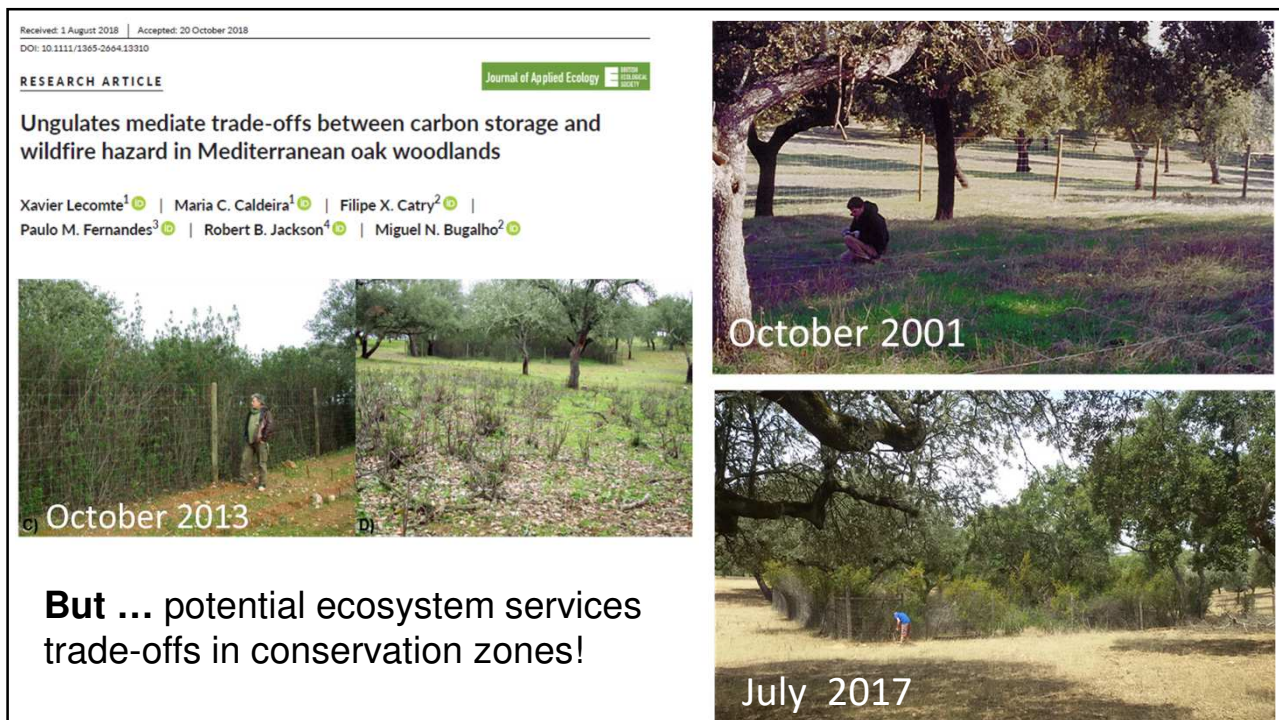
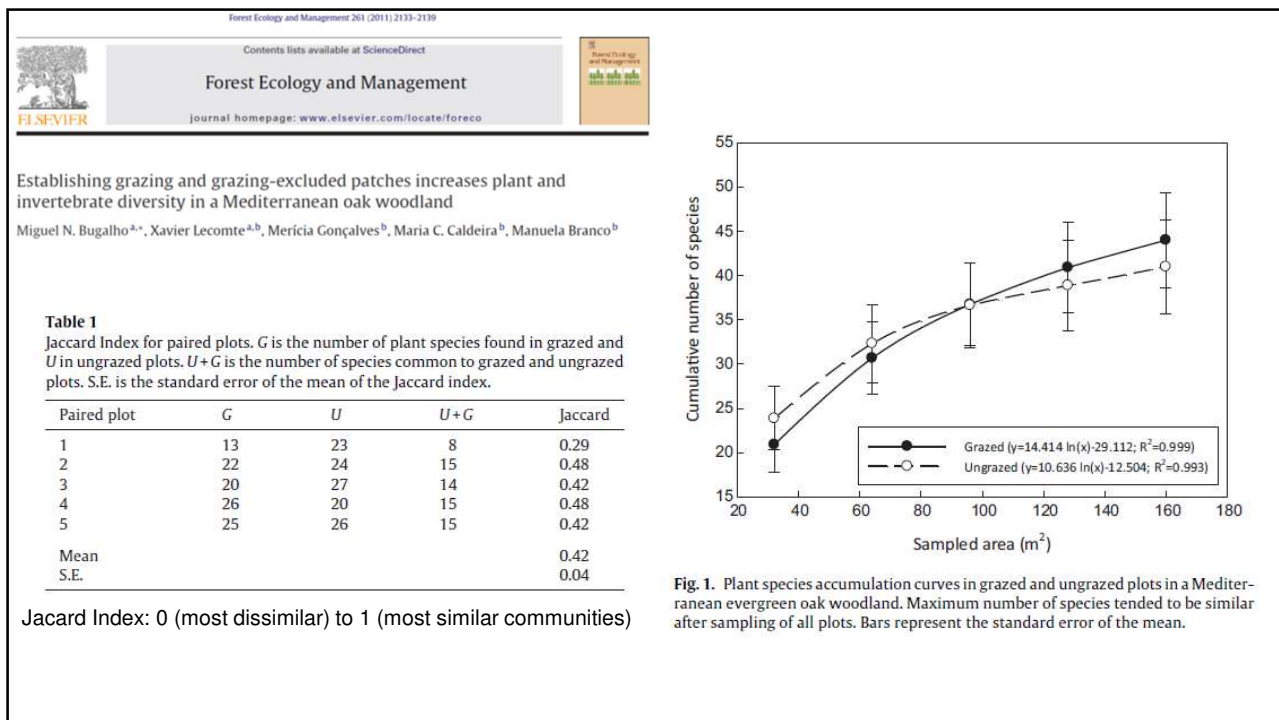


Figure 2. Seed removal per vegetation type. Proportion of seeds remaining over time in forests (black dots, solid line), savannas (grey dots, broken line), and shrublands (white dots, dashed line).



Acacio et al. 2007 Ecosystems



Ecosystem services trade-offs in conservation zones: aboveground carbon x fire

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RESEARCH ARTICLE

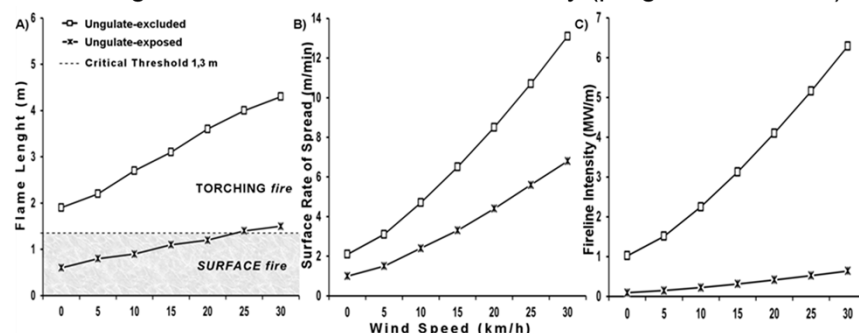
Journal of Applied Ecology

Ungulates mediate trade-offs between carbon storage and wildfire hazard in Mediterranean oak woodlands

Xavier Lecomte¹ | Maria C. Caldeira¹ | Filipe X. Catry² |
Paulo M. Fernandes³ | Robert B. Jackson⁴ | Miguel N. Bugalho²



Modelling of wildfire behaviour and severity (program BEHAVE)



REVIEWS REVIEWS REVIEWS

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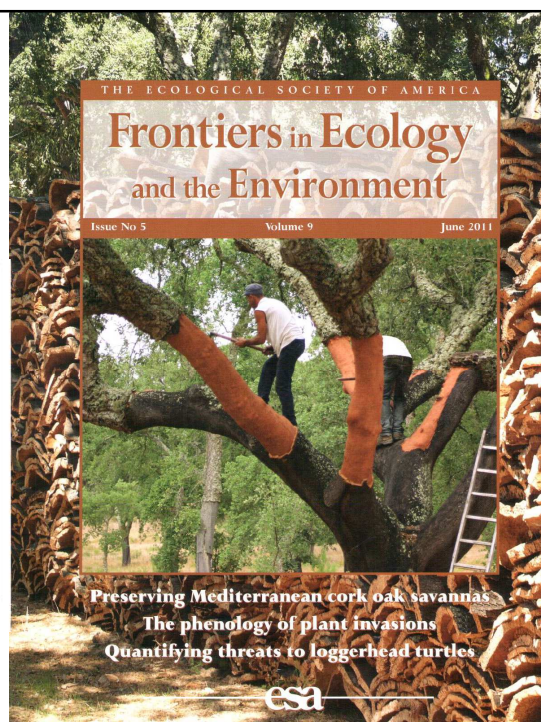
Mediterranean cork oak savannas require human use to sustain biodiversity and ecosystem services

Miguel N Bugalho^{1,2*}, Maria C Caldeira³, João S Pereira³, James Aronson^{4,5}, and Juli G Pausas⁶

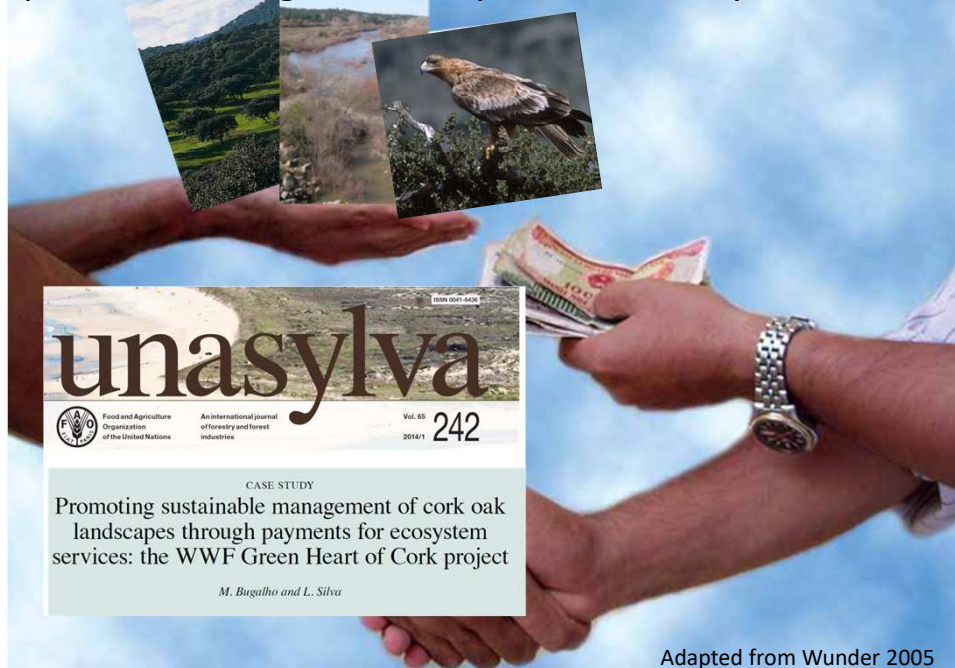
Table 2. PES mechanisms to compensate landholders for services that they can provide but are not still compensated for in cork oak savannas

Targeted	Paid for	Who buys?	Who else benefits?	Who sells?	Mechanism
Carbon	Best management practices; oak savanna restoration; oak regeneration	Government; corporate sector	Global community; local community	Landholder	REDD+; FSC; voluntary market; compliance market
Biodiversity	Best management practices	Government; corporate sector; conservation NGOs	Global community; local community	Landholder	REDD+; FSC; voluntary market
Water	Best management practices	Government; municipalities; water companies; downstream users	Local farmers; local community	Landholder	Voluntary market

Notes: Carbon storage, biodiversity conservation, and potential water regulation services can be targeted through payment of best management practices. These services can be bought through public (eg government) or private (eg corporations) funds benefitting the global or local communities. In North African countries, local communities, which do not hold the land but exploit the resources, must be rewarded for sustainable management practices that simultaneously enhance their livelihoods. Adapted from Wunder et al. (2008).



Responsible management: Payment for ecosystem services?



FSC Principle #9

High Conservation Value Forests

Biodiversity



HCV1 Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.

E.g. the presence of several globally threatened bird species.



HCV2 Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

E.g. a large tract of Mesoamerican flooded grasslands and gallery forests with healthy populations of Hyacinth Macaw, Jaguar, Maned Wolf, and Giant Otter, as well as most smaller species.



HCV3 Rare, threatened, or endangered ecosystems, habitats or refugia.

E.g. patches of a regionally rare type of freshwater swamp.



HCV4 Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

E.g. forest on steep slopes with avalanche risk above a town.



HCV5 Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.

E.g. key hunting areas for communities living at subsistence level.

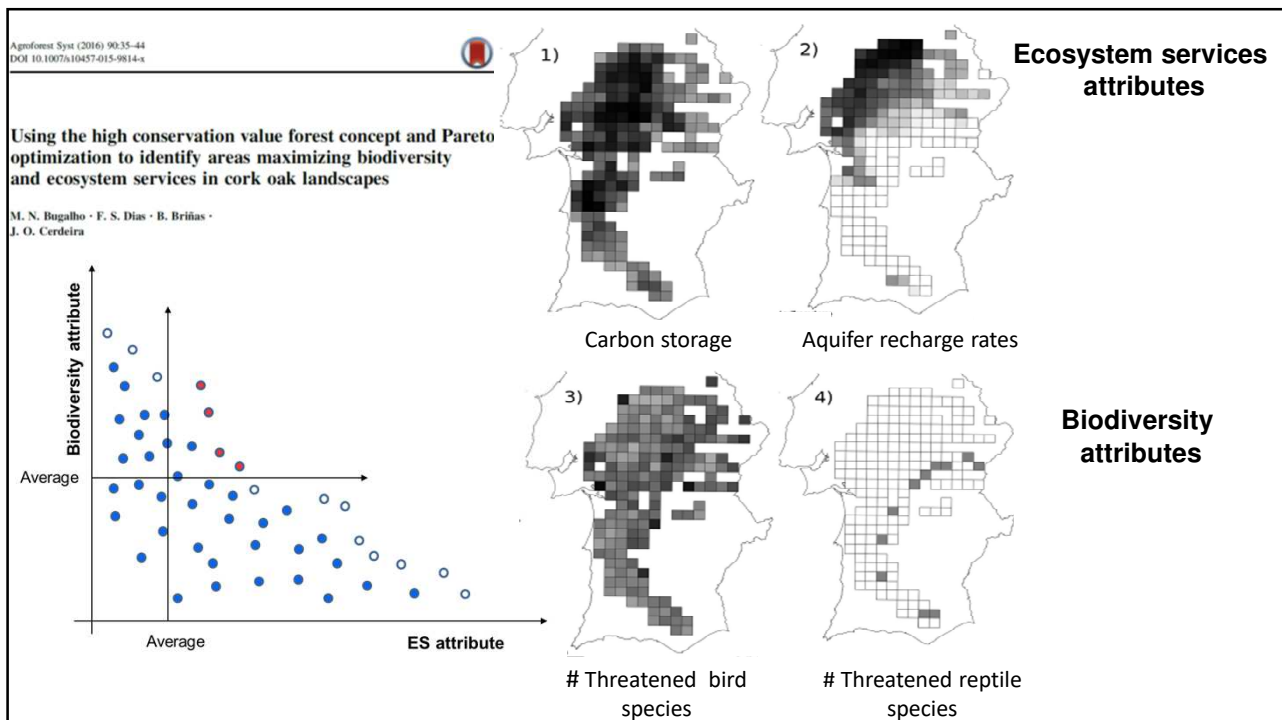
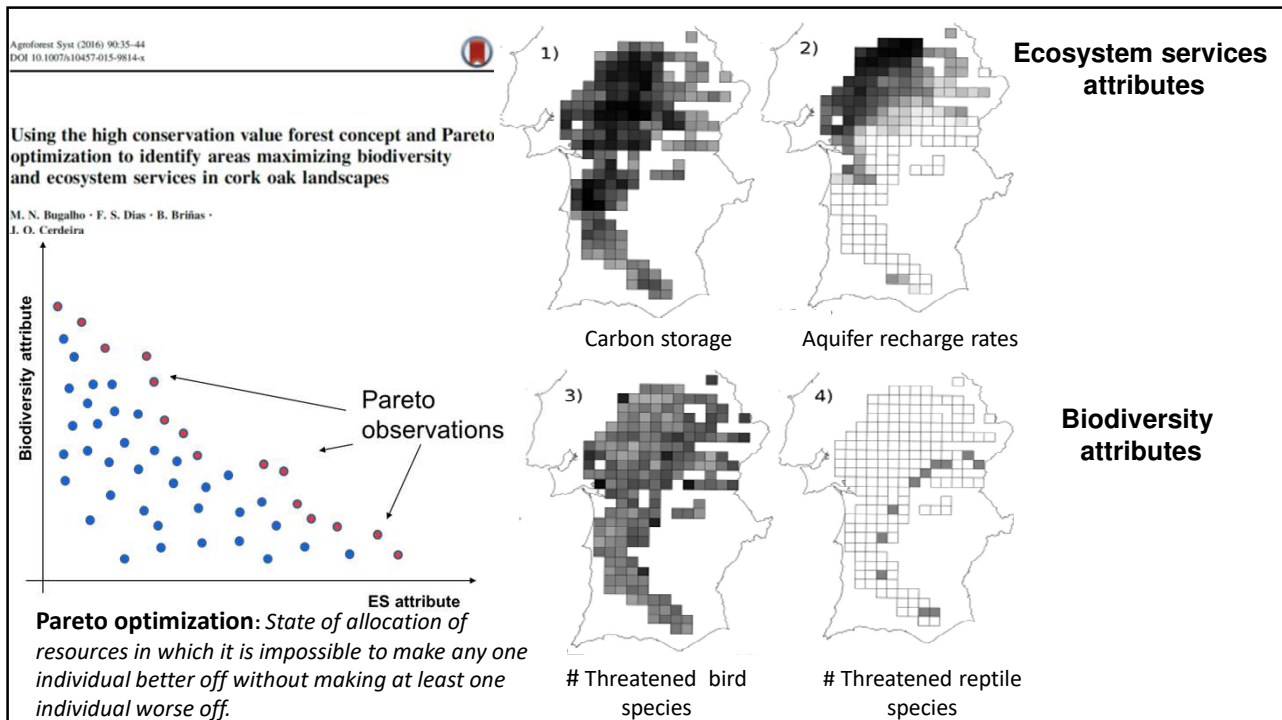


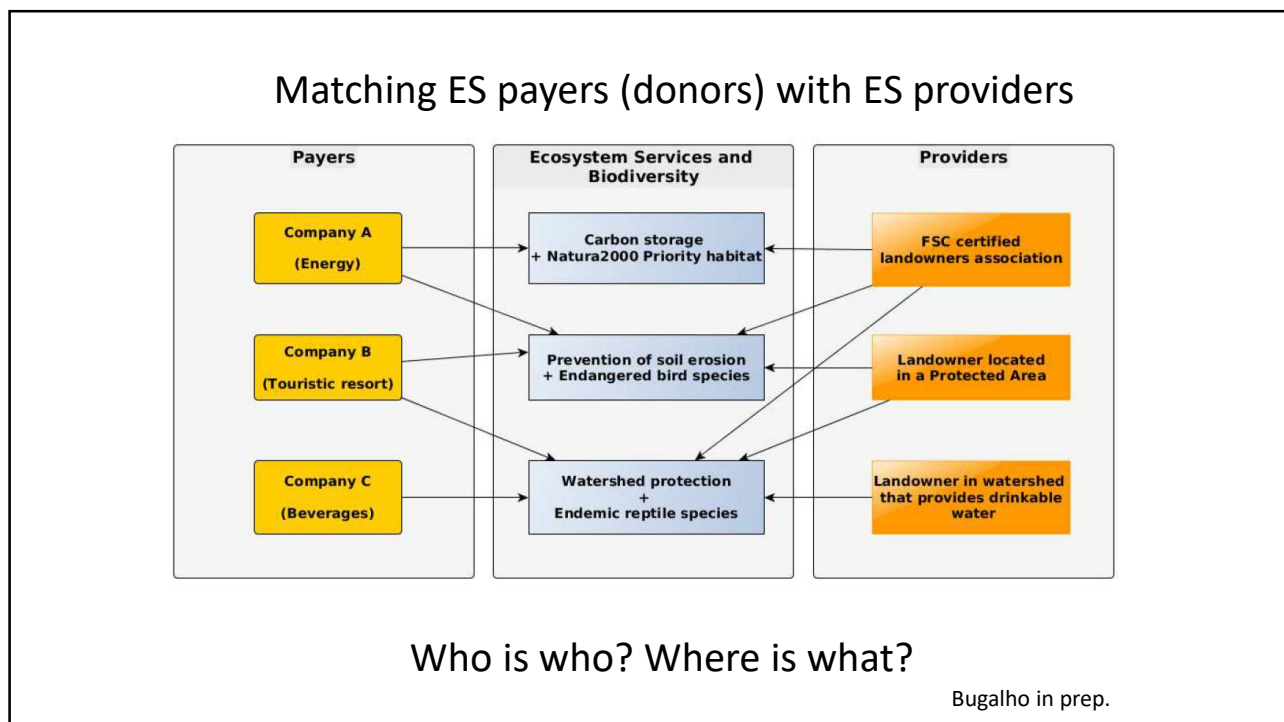
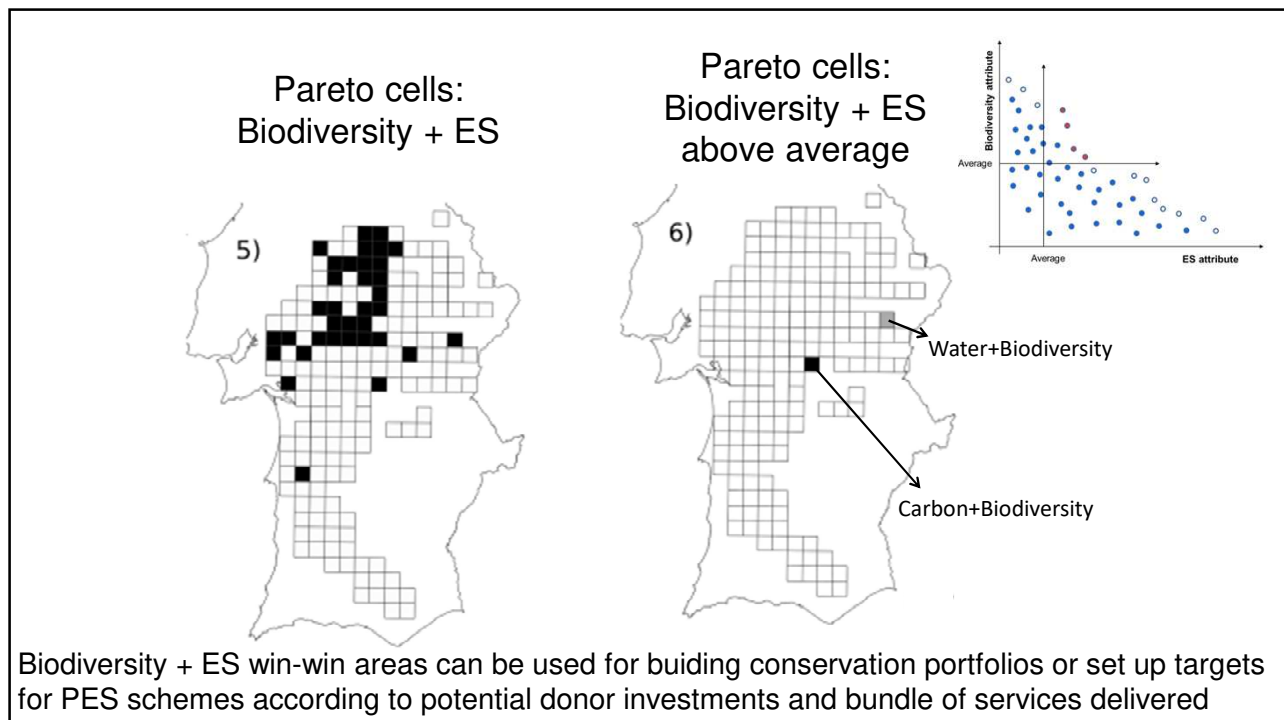
HCV6 Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

E.g. sacred burial grounds within a forest management area or new agricultural plantation.

Source: www.hcvnetwork.org

Ecosystem Services





Conclusions

- *Conservation zones* (Principle #6): favoring oak regeneration and understorey shrub diversity but... potential trade-offs among ES
- *High conservation values* (Principle #9): sistematic inventory of biodiversity and ecosystem services (e.g. identification of conservation portfolios for PES schemes)
- Under work: assessement of trade-offs, diversity of animal communities, biometrics and health status of the stands

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Thanks for your attention!
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