



**Creating conservation portfolios: identifying areas optimizing biodiversity and ecosystem services in cork oak landscapes**

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## Rationale

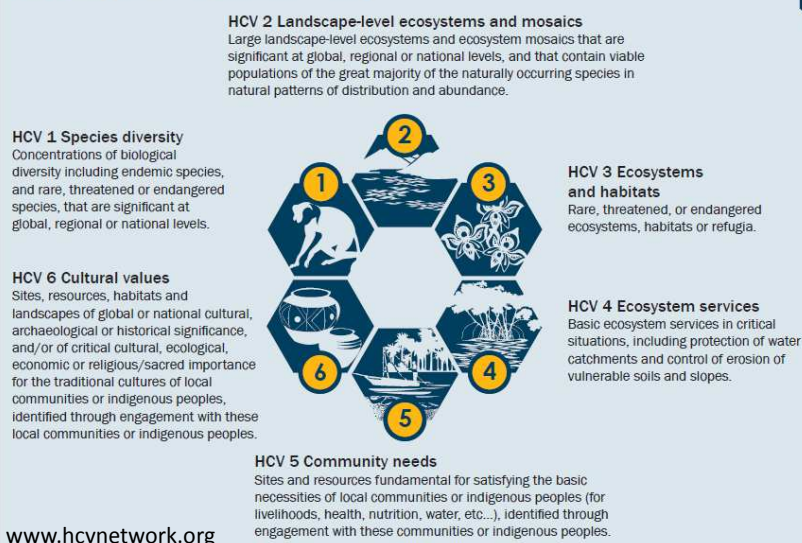
- Sustainable Management (SM) of ecosystems (including silvopastoral) is crucial for the conservation of biodiversity;
- Payment for Ecosystem Services (PES) may be used as a tool to incentivize SM in biodiversity x ES win-win locations.

## But... (some technical issues, among others...)

- Systematic, standardized, inventory of biodiversity and ES attributes needed;
- PES mechanisms assuring compliance with SM practices implemented;
- Matching ES providers with ES payers (donors) required;
- Dealing with multiple combinations of biodiversity and bundled ESs.

## Systematic inventory of Biodiversity and ES attributes: The High Conservation Value framework (or others...)

### Box 1: The Six High Conservation Values



Brown et al 2013

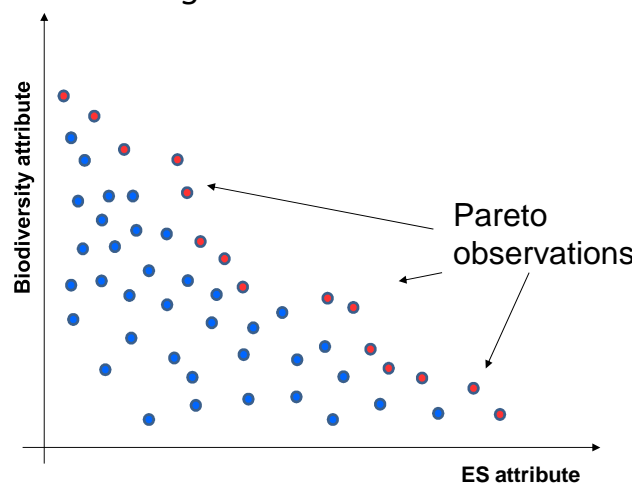
## Compliance with SM practices: Certification schemes

**TABLE 1: HCV IN DIFFERENT COMMODITY CERTIFICATION STANDARDS**

CERTIFICATION STANDARD	EXPLICIT USE OF "HCV"	SUPPORTING PRINCIPLES
Forest Stewardship Council (FSC) 	<ul style="list-style-type: none"> <li>• <b>Principle 9</b> High Conservation Values</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Principle 3</b> Indigenous Peoples' Rights</li> <li>• <b>Principle 4</b> Community Relations</li> <li>• <b>Principle 6</b> Environmental values and impacts</li> </ul>
Roundtable for Responsible Palm Oil (RSPO) 	<ul style="list-style-type: none"> <li>• <b>Principle 5</b> Environmental responsibility and conservation of natural resources and biodiversity</li> <li>• <b>Principle 7</b> Responsible development of new plantings (respecting local people's land and conserving primary forest and peat lands)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Principle 1</b> Commitment to transparency</li> <li>• <b>Principle 2</b> Just land acquisition</li> <li>• <b>Principle 6</b> Responsible consideration of employees and of individuals and communities affected by growers and mills</li> </ul>
Bonsucro (sugar) 	<ul style="list-style-type: none"> <li>• <b>Principle 4</b> Actively manage biodiversity and ecosystem services</li> <li>• <b>Principle 5</b> Continuously improve key areas of business</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Principle 1</b> Obey the law</li> <li>• <b>Principle 3</b> Manage input, production and processing efficiencies to enhance sustainability</li> </ul>
Roundtable for Responsible Soy (RTRS) 	<ul style="list-style-type: none"> <li>• <b>Principle 4</b> Environmental responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Principle 3</b> Responsible community relations</li> <li>• <b>Principle 5</b> Good agricultural practices</li> </ul>

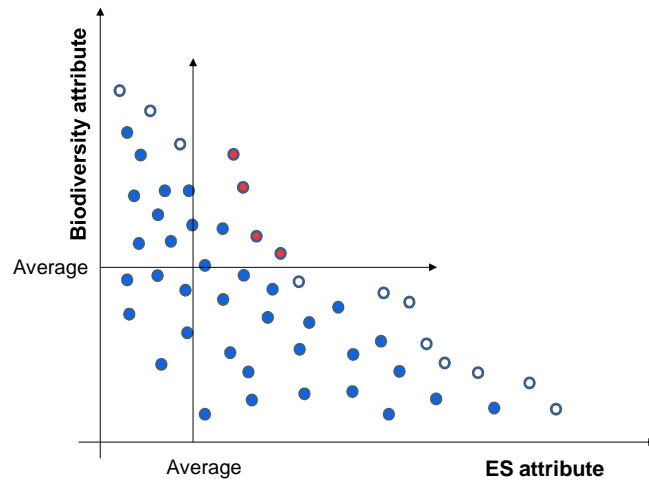
Brown et al 2013

**Pareto optimization:** *State of allocation of resources in which it is impossible to make any one individual better off without making at least one individual worse off.*



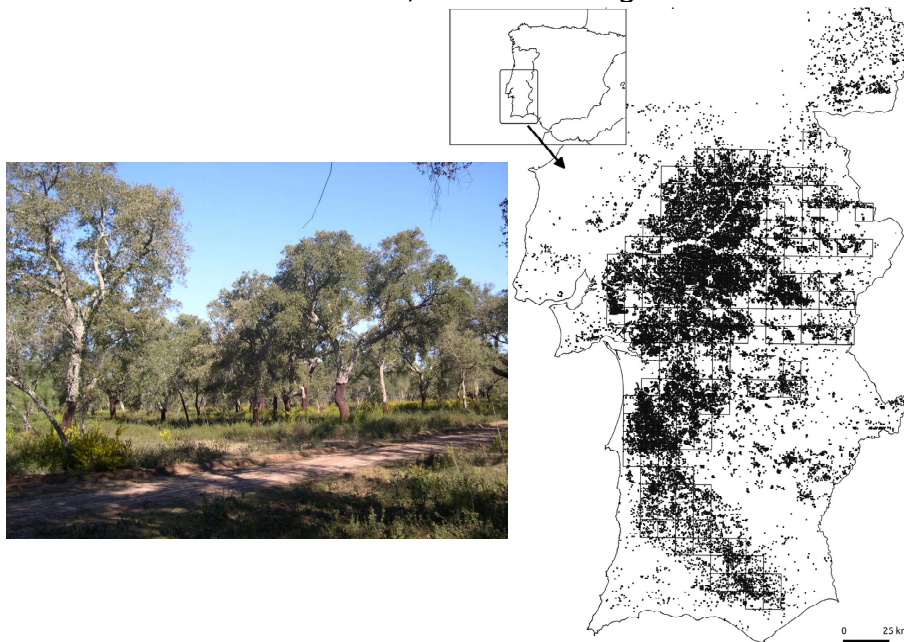
Vilfredo Pareto (1848-1923)

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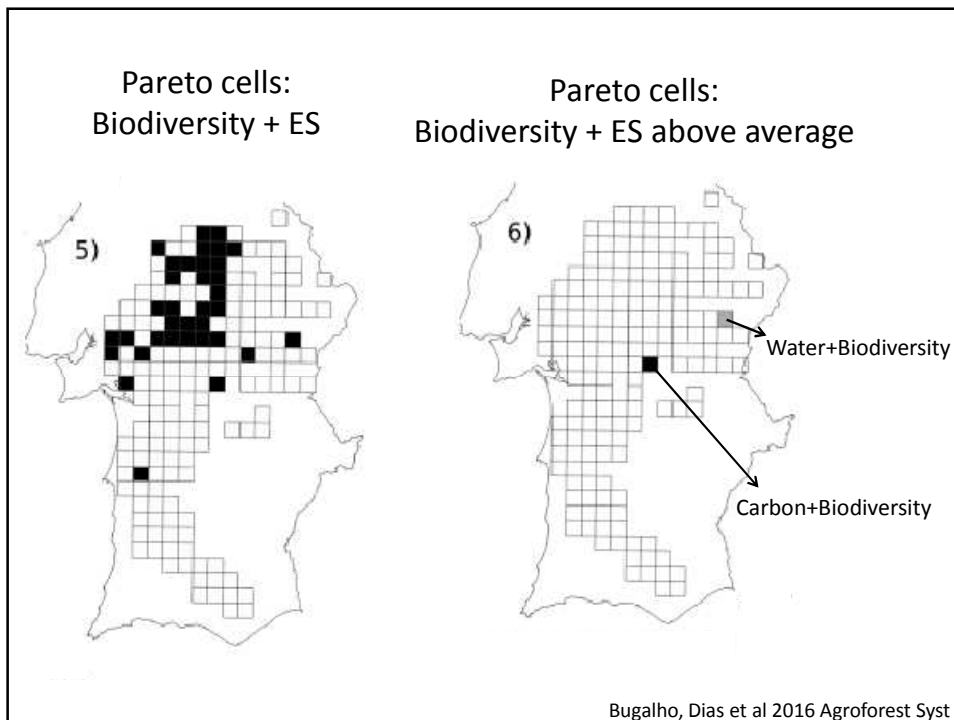
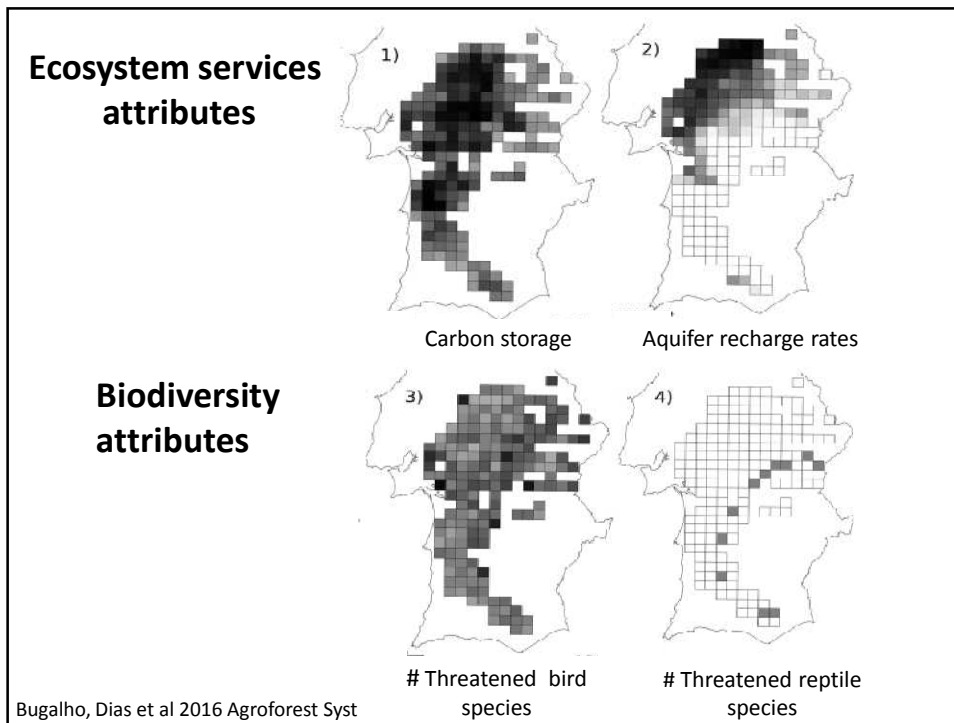


Vilfredo Pareto  
(1848-1923)

Cork oak woodland distribution, southern Portugal



Bugalho, Dias et al 2016 Agroforest Syst



**Take home message:**

Creation of conservation portfolios (in silvopastoral or other systems) implies dealing with:

- Multiple ecosystem services
- Multiple biodiversity attributes
- Multiple landowners
  
- Pareto optimization may be used to identify target areas