

## Using the Pareto Frontier Method to analyse trade-offs between ecosystem services; towards effective management policies at landscape level

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Ecosystem services (ES) are benefits that properly functioning ecosystems provide for human societies through provision, regulation, cultural and supporting services. Forest provide several ES such as timber, food, fuel, genetic resources, carbon storage, biodiversity, climatic and water regulation, erosion protection, cultural and recreational services. Many of these forest ES are in trade-offs, meaning that the production of one service has negative effect to others. The assessment of relationship between ES can help to optimise the forest management and provide further insight about the forest management planning problem and help set adequate levels of achievement for various objectives.

**Objective:** To develop a trade-off assessment of ES in Mediterranean conditions at landscape level. Preliminary targeted ESs are: timber, biodiversity, carbon sequestration, risk of fire and risk of erosion.

**Methodology:** Combination of Pareto-Frontier method, interactive decision maps and simulation approaches. The interactive Pareto frontier can handle up to seven objectives simultaneously and it has been used to assess trade-offs between carbon storage, timber and cork production (see Borges et al. 2014; Garcia-Gonzalo et al. 2015). This method could be used at the landscape level assessment of ecosystem service trade-offs.

**Data:** Existing models, and national forest inventory records (2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup>), additional records: land uses, databases and maps.

**Time-frame:** ca 1 month. The first half will be focuses on discussing and learning the methods and decide the final details of the study case, and processing the necessary data (data available in the CTFC databases). The second half will be focused on preparing the manuscript and to plan post-doc research based on the topic.