



Scenario-based modelling for management of Mediterranean forests: a review.

Alejandra Morán-Ordóñez, Kaori Otsu, Lluís Coll, François Lefèvre, Lluís
Brotons

► To cite this version:

Alejandra Morán-Ordóñez, Kaori Otsu, Lluís Coll, François Lefèvre, Lluís Brotons. Scenario-based modelling for management of Mediterranean forests: a review.. International conference on scenarios and models, Biodiversity and Ecosystem Scenarios Network (ScenNet). Paris, FRA. Fondation pour la Recherche sur la Biodiversité (FRB), FRA., Aug 2016, Montpellier, France. 100 p. hal-01604813

HAL Id: hal-01604813

<https://hal.science/hal-01604813>

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Scenario-based modelling for management of Mediterranean forests: a review.

Alejandra Morán-Ordóñez^{*†1}, Kaori Otsu², Lluís Coll^{3,4}, François Lefevre⁵, and Lluís Brotons¹

¹Inforest Joint Research Unit (CSIC-CTFC-CREAF) – Spain

²CREAF — Ecological and Forestry Applications Research Centre (CREAF) – Spain

³Forest Sciences Research Centre of Catalonia (CTFC) – Spain

⁴University of Lleida (UDL) – Spain

⁵INRA, Ecologie des Forêts Méditerranéennes (URFM) (INRA - URFM) – Institut National de la Recherche Agronomique - INRA (FRANCE) – France

Abstract

The number of studies aimed at understanding the complexity of ecological patterns and processes and their interaction with human societies has dramatically increased in the last two decades, but especially since the publication of the Millennium Ecosystem Assessment reports in 2003 and 2005. Integrative models and scenarios are key tools to disentangle this complexity, forecast the ecological consequences of current and future states of societal development and support well-informed decision making. But, what's the state of the art in the development and application of these tools?

We are conducting a review of the methods and scenarios in use for evaluating the future of biodiversity and ecosystem services provision in the context of forest systems across the Mediterranean basin. The review is framed within the international ERA-net Foresterra INFORMED project (INtegrated research on FOrest Resilience and Management in the MEDiterranean) that seeks to foster forest system resilience through biodiversity management (from genes to communities). Mediterranean forests represent a good example of biodiversity-rich and complex ecological systems, with a long history of human perturbations and management and currently threatened by ongoing global change. With our review, we aim to know which types of models are more widely used (correlative vs process-based) and how widespread is the implementation of integrated modelling approaches – those accounting for feedbacks across sectors (e.g. agriculture and forestry) and spatial scales within a single modelling framework. We also evaluate the prevalence of the use of multi-driver scenarios – those accounting for the simultaneous impacts of multiple direct and indirect drivers (e.g. climatic, land use, management) – and single-driver scenarios in literature. The overall goal is to understand the state of the art in how indicators of the state of Mediterranean forests are being developed/modelled, and to identify priority areas for future research.

Preliminary results show that the number of studies that focus on a single biodiversity or ecosystem service indicator, use a single model or scenarios based on a single-driver outnumber the more integrative studies. Our study will directly inform the currently-in-progress

^{*}Speaker

[†]Corresponding author: alejandra.moran@ctfc.es

regional European and Central Asia assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) on integrated assessment modelling and scenarios.

Keywords: Integrated Assessment Models, Mediterranean Forests, Modelling biodiversity and ecosystem services, Scenarios