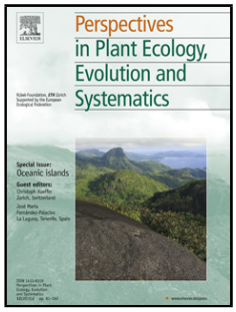
Accepted Manuscript



Title: Modelling understorey dynamics in temperate forests under global change– challenges and perspectives

Authors: D. Landuyt, M.P. Perring, R. Seidl, F. Taubert, H. Verbeeck, K. Verheyen

PII: S1433-8319(17)30165-8
DOI: https://doi.org/10.1016/j.ppees.2018.01.002
Reference: PPEES 25397

To appear in:

Received date: 4-10-2017
Revised date: 15-12-2017
Accepted date: 18-1-2018

Please cite this article as: Landuyt, D., Perring, M.P., Seidl, R., Taubert, F., Verbeeck, H., Verheyen, K., Modelling understorey dynamics in temperate forests under global change– challenges and perspectives.Perspectives in Plant Ecology, Evolution and Systematics https://doi.org/10.1016/j.ppees.2018.01.002

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Modelling understorey dynamics in temperate forests under global change– challenges and perspectives

[1,*]Landuyt, D., [1,2]Perring, M. P., [3]Seidl, R., [4]Taubert, F., [5]Verbeeck, H., [1]Verheyen, K.

[1]Forest & Nature Lab, Department of Forest and Water Management, Ghent University, Geraardsbergsesteenweg 267, 9090 Melle-Gontrode, Belgium

[2]Ecosystem Restoration and Intervention Ecology Research Group, School of Biological Sciences, The University of Western Australia, 35 Stirling Highway, Crawley WA 6009, Australia

[3]Institute of Silviculture, Department of Forest- and Soil Sciences, University of Natural Resources and Life Sciences (BOKU), Peter Jordan Straße 82, 1190 Vienna, Austria

[4]Department of Ecological Modelling, Helmholtz Centre for Environmental Research – UFZ, Permoserstraße 15, 04318 Leipzig, Germany

[5]Computational and Applied Vegetation Ecology (CAVELab), Department of Applied Ecology and Environmental Biology, Ghent University, Coupure Links 653, 9000 Ghent, Belgium

[*]Corresponding author (dries.landuyt@ugent.be)

Highlights

- Understoreys are an important functional component of temperate forests
- Global change affects understorey composition via a range of pathways
- We review 14 published understorey models and evaluate their comprehensiveness
- None of the existing models fully accounts for all potential effects of global change
- We suggest several ways forward to develop a next generation of understorey models

Abstract

The understorey harbours a substantial part of vascular plant diversity in temperate forests and plays an important functional role, affecting ecosystem processes such as nutrient cycling and overstorey regeneration. Global change, however, is putting these understorey communities on trajectories of change, potentially altering and reducing their functioning in the future. Developing mitigation strategies to safeguard the diversity and functioning of temperate forests in the future is challenging and requires improved predictive capacity. Process-based models that predict understorey community composition over time, based on first principles of ecology, have the potential to guide mitigation endeavours but such approaches are rare. Here, we review fourteen understorey modelling approaches that have been proposed during the last three decades. We evaluate their inclusion of mechanisms that are required to predict the impact of global change on understorey communities. We conclude that none of the currently existing models fully accounts for all processes that we deem important based on empirical and experimental evidence. Based on

Download English Version:

https://daneshyari.com/en/article/8849508

Download Persian Version:

https://daneshyari.com/article/8849508

Daneshyari.com