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The International Forestry Review

Forests for the Future: Sustaining Society and the Environment

XXIII IUFRO World Congress, 23–28 August 2010, Seoul, Republic of Korea

Abstracts

EDITORS

JOHN A. PARROTTA and MARY A. CARR

hierarchical linear modelling. The main parameters analysed were stem form, crown type, slenderness, and branch free bole length. At the stand level, the two treatments were compared on the basis of the number of future crop trees. This first silvicultural meta-analysis of a regeneration method will provide an important basis for future decisions about establishment of oak-dominated stands in Central Europe.

Adaptive forest management for climate change: strategies and specific options for central Europe. Spathelf, P. (*University of Applied Sciences Eberswalde, Germany, pspathelf@fh-eberswalde.de*).

Climate change is likely to increase the vulnerability of forests in Central Europe. Adaptive forest management can help forest ecosystems adapt to these new conditions to achieve management goals, maintain desired forest ecosystem services, and reduce the risks of forest degradation. With a focus on Central Europe, the following management strategies are presented: (1) perpetuation of forest structures, (2) active adaptation, and (3) passive adaptation. The feasibility and criteria for the application of the different strategies are discussed. Furthermore, silvicultural adaptation options at the stand level are outlined. Forest adaptation may entail the establishment of 'neo-native' forests, including the use and intermixing of native and non-native tree species as well as non-local tree provenances assumed to be less sensitive to climate change. An integrative adaptive management concept is proposed that combines: (i) species suitability tests and modelling activities at the international scale, (ii) priority mapping of adaptation strategies at the national to regional scale, and (iii) implementation at the local scale. An international experimental trial system is recommended to test suitable adaptive measures throughout Europe and worldwide.

Restoration for the future: adaptation to global change. Stanturf, J.A. (*U.S. Forest Service, USA; jstanturf@fs.fed.us*), Madsen, P. (*University of Copenhagen, Denmark; pam@life.ku.de*), Lamb, D. (*Queensland University, Australia; d.lamb@uq.edu.au*).

Restoration is generally regarded as a process of returning an ecosystem to conditions that existed before degradation, traditionally looking to past conditions for soft or hard targets. The prospect of global change, however, suggests that backwards is the wrong way to look, and restorationists should look forward to future climate conditions and construct resilient ecosystems. Anticipating future conditions is more complex than simulating increases in temperatures and decreases in precipitation. Global change is composed of the legacy effects of past alterations of natural systems; future drivers of change (increased population, larger environmental footprint, and globalization of impacts); climate change; ecosystem responses; human responses to climate change; and interactions with secondary effects. Critical changes will affect limiting conditions for regeneration, pest, and disturbance dynamics. Native and non-native species will invade new habitats or change competitive relations. Changed conditions will cause effects at variable rates and over a range of scales, complicating strategies for responding. Managers need strategic but adaptive approaches that focus on restoring resistance and resilience, or that facilitate adaptation for further change. By emphasizing function, restoration for future conditions will result in novel ecosystems and translocation of high-value current plant communities in novel locations.

Assessing drought risk in central Europe, based on forest monitoring data. Von Wilpert, K., Puhlmann, H. (*Forest Research Institute Baden-Wuerttemberg, Germany; Klaus.wilpert@forst.bwl.de; heike.puhlmann@forst.bwl.de*).

Climate change scenarios state an increasing probability for drought in Central Europe that may lead to severe disturbance of tree health and forest growth as well as damage to the filtering functions of soils. Hence adequate assessment of drought stress risk will be a precondition for silvicultural planning in the future. Forest monitoring data and a few additional measurements and/or evaluations allow for differentiated examination on the ecological effects of climate change scenarios. The aim of this talk is to demonstrate how routine monitoring data contribute to assessment of drought risk and to what extent further data and evaluations are needed. Matrix potential is a suitable tool to predict the intensity of drought stress limiting tree growth. To assess drought stress risk for whole landscapes, model results on parameters of water balance have to be related to the landscape scale. For this, we assessed soil hydraulic properties (water retention, water conductivity, and derived pedo-transfer functions (PTFs)) based on soil monitoring information. Soil hydraulic properties will be transferred from monitoring points, where their soil physical input parameters are measured, to the landscape scale by using upscaling methods. We show example results for soil texture, rooting depth, and soil skeleton.

Posters

Interactions between under- and over-storeys, consequences for designing silvicultural systems adapted to climate change. Balandier, P. (*CEMAGREF / INRA Clermont-Ferrand, France; philippe.balandier@cemagref.fr*), Ginisty, C. (*CEMAGREF Nogent-sur-Vernisson, France; christian.ginisty@cemagref.fr*).

Forests comprise several interacting strata of vegetation; overstorey trees are most obvious but sub-canopy strata, collectively termed understorey or undergrowth, are typically present including herbaceous plants, shrubs, seedlings and saplings, and suppressed under- and midstorey trees. For decades only adult trees have been considered in forests and most often, only crop trees. However the understorey also plays a fundamental role in ecosystem functioning and health. Various silvicultural systems are currently designed or experimented in relation with climate changes, and in particular a reduction of soil water availability together with an increase of scorching temperatures in many regions of the temperate area. Modifying tree species composition and density of the forest ecosystem will have consequences on the understorey composition and functioning, which in turn will interact with the overstorey. These interactions will modify the whole ecosystem functioning in terms of biodiversity, tree regeneration, wild fauna habitats, pest and diseases, etc. Therefore it is compulsory to account for the interplays between the different strata in forest to better design silvicultural operations relative to climate changes. Examples of such interactions will be given and consequences for designing experimental systems and new silvicultures will be discussed.

Changes of ecological niche of *Quercus acutissima* due to global warming. Cho, K.T., You, Y.H. (*Kongju National University, Republic of Korea; rbxo38@kongju.ac.kr; youeco21@kongju.ac.kr*).

Quercus acutissima is the dominant tree species on soils with high moisture status in open lowland habitats of South Korea. To investigate the ecological niche change of *Q. acutissima* due to warming, we cultivated saplings of *Q. acutissima* under elevated