Adaptive forest management approaches: A landscape Ecology Holistic view

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Abstract

Adapting the management of ecosystems to the uncertainty created by climate and other current drivers of change is an emerging topic in science and management. Adaptive management seems to be the only option to contribute to balancing multiple objectives under changing environmental conditions and to improving natural resources management in a wide range of territories. The incorporation of adaptive management principles, methods and solutions into sustainable forest management requires the integration of approaches, data, analysis procedures, scales, models and knowledge transfer initiatives into a new management paradigm for European forests. This is a particularly challenging research field today in Europe, where pressures towards the intensification of wood production and forest mobilization are growing and, at the same time, the need for the maintenance of a series of forest functions and for the provision of services by forest ecosystems, including biodiversity conservation is rising. Many of these functions and services require a integrative landscape perspective to be approached.

Although appealing, adaptive forest management is, in general, still confined within theoretical grounds but developments towards a full application into sustainable forestry are urgent. Forest landscape ecology, based on a holistic perspective of and on extensive research conducted in forest landscapes throughout the world over the last 30 years can support a full range of conceptual and methodological tools to support the incorporation of the adaptive perspective into sustainable forestry.

Focusing on biodiversity conservation as a proxy for the ecological dimensions of forest sustainability, we will describe and summarize major requirements necessary for the development and application of adaptive approaches and tools in forest management with emphasis on a landscape ecology holistic perspective. Major issues will be: (1) the conservation of habitat networks under changing environmental conditions in Europe, (2)the integration of ecological processes and ecosystem services into decision making in the forest sector, (3) concepts, methodologies and tools validated on strong scientific grounds to be proposed to policy and management implementation actors, and (4) the comparative advantages of a landscape ecological approach in forest management.