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SYSTEMIC SILVICULTURE, ADAPTIVE MANAGEMENT AND FOREST MONITORING PERSPECTIVES

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Systemic silviculture can be framed as an approach in which management practices are conceived as learning experiments. In the light of this, effective and efficient monitoring processes are required in order to inform and support the management taking explicitly into account the many system components, their interactions and its nonlinear behavior, a characteristic that determines important limitations with regard to the value of predictions. In order to evaluate evidence and turn data into decisions, monitoring effectiveness and efficiency encompass adequate statistical methods and tools for acquisition, processing and analysis of information from different sources. The present note highlights some key contributions on which to engage the development of forest monitoring under such a perspective.

Key words: sustainable forest management; complex systems; decision making; heuristic approach; uncertainty; causality.
P*arole chiave:* gestione forestale sostenibile; sistemi complessi; processi decisionali; approccio euristico; incertezza; causalità.

Citazione - CORONA P., SCOTTI R., 2011 – *Systemic silviculture, adaptive management and forest monitoring perspectives*. L'Italia Forestale e Montana, 66 (3): 219-224. doi: 10.4129/ifm.2011.3.05

FROM FORECASTING TO MONITORING

Sustainable forest management is quite a delicate task since it calls for the search of an harmonic composition of ecological, economic and sociocultural instances. This, contextualized within ever changing environmental and social values, leads to uncertainty and controversy on how to best manage toward moving goalposts.

Classical forest management, dominated since long by the reductionistic paradigm, is founded on two basic principles: (i) perpetuity of the forest based on the equilibrium between standing volume, standing volume increment and allowable cut; (ii) constrained optimisation of commodities (marketable or not). The latter, basically output-oriented indication, has led to simplifications of forest ecosystem structure and composition. Albeit the fundamental contribution of classical theory to forest preservation and to the development of forestry should not be undervalued, the development of applied ecology has highlighted how dangerous simplifications may be for ecosystems' functionality.

Its limitations and drawbacks have gradually outfit classical forest management from sustainability prospects: to this end, a significant paradigm shift is required to appropriately deal with complex living systems like the forests. Systemic silviculture (CIANCIO and NOCENTINI, 1997, 2004, 2011) grasps this challenge as it assumes as fundamental management goal the search for the functional efficiency of the forest ecosystem. In such a perspective: (i) the forest is perceived as an entity with intrinsic value; (ii) it is necessary to go beyond the management framework grounded mainly on the simplistic equilibrium between standing volume, standing volume increment and allowable cut; (iii) silvicultural practices are guided by an adaptive approach, based on trial and error, rather than on so-called normalisation schemes.

doi: 10.4129/ifm.2011.3.05