

# *Cultural values and sustainable forest management: the case of Europe*

**Mauro Agnoletti & Antonio Santoro**

**Journal of Forest Research**

ISSN 1341-6979

J For Res

DOI 10.1007/s10310-015-0500-7



**Your article is protected by copyright and all rights are held exclusively by The Japanese Forest Society and Springer Japan. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at [link.springer.com](http://link.springer.com)".**

# Cultural values and sustainable forest management: the case of Europe

Mauro Agnoletti<sup>1</sup> · Antonio Santoro<sup>1</sup>

Received: 16 October 2014 / Accepted: 2 June 2015  
© The Japanese Forest Society and Springer Japan 2015

**Abstract** The European continent still has a rich heritage of rural landscapes built up over thousands of years. The UNESCO-sCBD Florence Declaration of 2014, describes it as being predominantly a biocultural landscape, as it assimilates economic, social, cultural, and environmental processes in time and space. This definition also includes the forests, which have been affected by several centuries of human action and are also a part of the European cultural heritage. However, an approach to forest landscapes often employing the same tools used for nature conservation has led to a definition of management tools mostly based on ecological characteristics. The origin of forests and woodlands is rarely interpreted as the result of human activities and protected and managed accordingly. The three pillars on which Sustainable Forest Management (SFM) in Europe are based are ecological values, economic values, and sociocultural values. However, no political resolutions requiring countries to develop strategies and carry out actions for the preservation of cultural forests have been developed so far. The fact that cultural values currently play a limited role in SFM indicates the scant consideration given to the role of culture and history, as well as the lack of a comprehensive landscape approach. Failure to effectively and coherently address culture and history may very well be an emerging weakness that needs

to be reconciled, especially now that the landscape approach is proposed on a global scale as a new perspective for sustainable development. One of the consequences of this failure has been the widespread application of an idea of ‘naturalness’ to places that are not natural, threatening the conservation of the cultural identity of local populations and the historical values of forests, and favoring processes of abandonment and renaturalization. The present paper advocates the practical implementation of existing tools for protecting cultural forest landscapes, such as the MCPFE Guidelines for Social and Cultural Values in SFM and the UNESCO-sCBD Florence Declaration.

**Keywords** Biocultural diversity · Cultural values · Forest policies · Landscape management

## Introduction

Nowadays we are witnessing increasing interest in landscape at the national and international level. The need to preserve the identity and meaning of places expressed by the current demand for landscape reflects a deeper malaise that has to do with globalization processes and with the consequent effects of homologation, modernization, imbalances, and inequalities. The prevalence of aesthetic considerations in past conceptions of landscape, especially between the fifteenth and nineteenth century among European travelers of the “Grand Tour” (Hibbert 1987), was followed by the development of ecology and studies approaching landscape with the same tools used for nature conservation in the second half of the twentieth century (Agnoletti 2013). This has led to the definition of criteria for the assessment of landscape quality mostly based on

---

✉ Mauro Agnoletti  
mauro.agnoletti@unifi.it

✉ Antonio Santoro  
antonio.santoro@unifi.it

<sup>1</sup> Laboratory for Landscape and Cultural Heritage (CultLab), Department of Agricultural, Food and Forestry Systems (GESAAF), University of Florence, via San Bonaventura 13, 50145 Florence, Italy

ecological characteristics, pushing in the background the strong human print on the landscape, and the fact that the transformations of rural landscapes, including forest landscapes, have been largely endogenous. According to Carl Sauer (1925) “a cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area the medium, the cultural landscape the result.” Taking into account this definition, we might conclude that most rural landscapes have a cultural origin and are indissolubly tied to farming, forestry, and grazing practices.

Ordinary legislation based on nature conservation, protected area systems, or landscape restrictions is often ineffective as a means to preserve cultural landscapes, and particularly historical forest landscapes (Agnoletti 2013). In the forest sector there has been a growing interest in understanding the role of cultural values. An international seminar on “Forestry and our cultural heritage” was held in Sunne (Sweden) in 2005. The seminar was organized as a joint effort of Sweden, the Joint FAO/ECE/ILO Expert Network, and the MCPFE Liaison Unit Warsaw. The following year a meeting on “Cultural heritage and sustainable forest management: the role of traditional knowledge” was held in Florence, Italy. These conferences, which produced scientific papers and volumes of proceedings, attracted representatives from a variety of international organizations and forest policy bodies, including the UNFF, FAO, UNCCD, UNESCO, the European Landscape Convention of the Council of Europe, and the MCPFE Liaison Unit (MCPFE 2006; Parrotta et al. 2006). The meetings confirmed that the management and conservation of cultural heritage related to forestry and forested landscapes not only protects biodiversity that has been created by and is subject to human activity, but could also favour economic growth of these rural areas by promoting local products, encouraging tourism development, and eventually contributing to a higher quality of life for the local population. Despite these efforts, especially in Europe, there have been many difficulties in going from research to the definition of policies and actions effectively recognizing and transferring cultural values in forest management.

## Europe as a case study

Europe is an area of the world where important environmental policies have been developed since the Rio de Janeiro Conference in 1992. The continent still has a rich heritage of rural landscapes built up over thousands of years. These landscapes still retain evident testimonies of their historical origin—although with different degrees of integrity—and maintain an active role in society and economy. According to the European Commission, 77 %

of land in EU-27 is classified as “rural,” including 30 % of forestland and 47 % of farmland (European Commission 2013). The European Commission recognized that 95 % of the EU area was mostly of cultural origin as early as 1999. One would imagine that the cultural values of the rural landscape would have become a major concern of forest policies, but this has not been the case so far.

In the first decades of the EU Common Agricultural Policy (CAP), strong support for production and technological development produced an intensification of agriculture that deeply modified the traditional structure of rural landscapes, with negative effects of abandonment of the less productive areas, where the most valuable cultural landscapes are found (Reho 2006). In those years, forest policies were still affected by a tendency to favor timber production; still, forestry was slowly moving from an economic approach to an environmental approach. The MacSharry reform of 1992 shifted attention to the environment (Cunha and Swinbank 2011). The focus was caring for the environment and having more nature in the countryside, making Europe more “green” with actions directed toward protecting natural habitats, renaturalization and planting new forests. These policies were also supported by the indications of various Forest Action Plans and resolutions concerning sustainable forest management (MCPFE 2003; IUFRO 2007; Agnoletti 2014).

The above strategies were largely informed by the “degradation” paradigm, emphasizing the negative role of man in the environment, as an agent depleting the ideal state of “naturalness” and biodiversity (Balée 1998; Agnoletti 2014). Tools such as the EU Habitat Directive of 1992 were created with this kind of nature conservation in mind (Berger et al. 2006), focusing on the safeguarding of natural habitats, and not of habitats whose primary value is cultural. In the new agricultural policies for 2014–2020, the landscape is still included among “ecological focus areas,” suggesting the notion that one needs an ecological focus to justify the importance of landscape. The European Landscape Convention (Council of Europe 2010) could have been an important opportunity, but it has remained marginal in the political debate on rural development and nature conservation, and has had almost no influence on forest policies. Indeed, while there is a Habitat Directive for nature conservation, the European Commission has so far issued no landscape directive.

One of the reasons for overlooking cultural values in environmental policies is the reduced impact of cultural studies in environmental science. There is also a reduced amount of scientific production exploring and promoting cultural forests, since their features have been often interpreted as negative from the ecological point of view. Reduced densities, fragmentation, and simplification of structure and species composition are often interpreted as

cultural influences modifying the ideal natural state of a forest. The other reason for the lack of actions or directives preserving cultural forests is the scarce importance of farmers in the European population (5.4 %) and the scarce importance of farming in the GDP (about 1.6 %), with an even smaller number of local farmers and foresters still managing forests. This means that only a very small percentage of the European population is truly aware of the features and the origin of rural landscapes, including forests. Current forest policies mostly reflect the views of the urban population about the role and features of forests, which are usually seen exclusively as “nature” and not as a cultural product.

### The degradation of cultural and historical values of the European forest territory

The degradation of cultural landscapes is a general process, connected to the reduced importance of farming and the disappearance of forest practices associated with traditional farming. Before the industrialization of agriculture, only rarely did one run a farm or raise cattle in Europe without the support of a forest. Forests and woodlands were managed with different techniques, favoring coppice or high stands according to the need of farming and grazing. The reduction of farming has determined the abandonment of traditional forest practices, with a consequent loss of the historical evidence for cultural influences on forests. Besides, it has resulted in the growth of new woodland on formerly cultivated land. This growth is usually unmanaged, and, hence, has little historical and cultural value. In this respect, the growth of unmanaged secondary forests on abandoned land can be regarded as a measure of the general decline of cultural influence on rural land.

Despite past claims for deforestation and desertification in the 90's, in Europe we are witnessing a steady increase of land classified as forest, from Sweden to Italy. According to the FAO (FAO 2010), in the past 20 years forests in Pan-European countries (MCPFE) have increased by 850,000 ha a year. Today more than 47 % of European land is covered with forest, ranging from 1 % on Malta to 68 % in Finland (MCPFE 2003). Almost all the official reports consider this to be a positive trend, which is probably true for some ecosystem services, but such generalizations do not take account of factors like the loss of cultural values or the problem of food production. In Italy forests increased from 4 to 11 million hectares in the past 100 years, while reforestation on abandoned land is estimated at about 85,000 ha/year (Agnoletti 2013). In France, spontaneous reforestation in the 1992–2002 period is estimated at about 97,000 ha/year (Mottet et al. 2006).

European agriculture decreased by about 16 % between 1961 and 2000 (Rounsevell et al. 2006). This trend is in

regard to both northern and southern Europe. Between 1920 and 2005, Sweden and Norway witnessed a steady decline of agriculture (Hamre et al. 2007). Between 1830 and 1995, Austrian agriculture declined by 35 % (Krausmann 2001). In Italy, agriculture declined by 50 % between 1861 and 2010 (Agnoletti 2013), and in Spain dry-farmed land decreased by 25 % between 1989 and 1999 (Serra et al. 2008). This decline is particularly strong in the areas that are not suitable for intensification, such as mountain territories or high hills, where the ongoing process of abandonment led to reforestation. The abandonment of traditional forest practices and the growth of new forests often creates homogeneous cover with very little spatial diversity, contributing to the loss of cultural values. Rural landscape diversity has declined by 45 % in Tuscany in the past 100 years, and even by as much as 80 % in mountain areas, where woodland has increased the most (Agnoletti 2006). In the case of woods such as chestnut orchards, the rewilding involves the arrival of new tree species, a process entirely supported by the current EU environmental policies and by EU nature conservation and ecological science, with little attention to the loss of cultural values. The fragmentation typical of many traditional landscapes is also regarded as dangerous for the conservation of natural habitats (Larsson 2001).

Reduction of spatial diversity also occurs in the case of the abandonment of pastured woods, where the regeneration filling the gaps in the canopy cover is considered perfectly sustainable by forest certification or nature conservation standards. Pastures have always made an essential contribution to the biodiversity of farming–forest–pasture systems. There are no statistics concerning wood pastures, but pastures and meadows have generally suffered a strong decrease in the last century in favor of homogeneous forest covers. In the Alpine areas of central Europe, both pastureland and meadows have been continuously decreasing (Höchtel et al. 2005). No measure for the loss of the cultural or historical values of a forest, or a landscape, has been introduced in science, management, and protection; what is most often measured is the distance between the current state and the “natural state” of a forest.

### Forest policy and cultural values

Despite the above-mentioned 1999 classification by the European Commission and UNESCO-CBD Florence Declaration, the State of Europe's Forests (Forest Europe 2011) classifies about 87 % of European forests as “semi-natural,” while only 4 % is classified as “undisturbed by men.” One wonders why woodlands deeply affected by some millenniums of human history should be classified as semi-natural instead of semi-cultural, or cultural *tout court*. The

density of forests and their species composition have been heavily modified by man, as in the case of the widespread introduction of conifers in almost all the countries of central Europe, which often involved the doubling of the extension of pure conifer forests through afforestation or management (Johann et al. 2004). Other cases could be the extension of chestnut orchards in the south of Europe at least since Roman times, but also management forms as many different types of coppicing, pollarding, shredding, as other practices at single tree level, distributed from Sweden to Italy, have received a reduced attention (Andersson et al. 2008). The above classifications confirm the interest in maintaining only two categories: natural and semi-natural. There is little interest in recognizing the historical origin of most forests by introducing the category of “cultural,” which seems as appropriate as the other two.

The issue of cultural values in sustainable forest management is a very good example of the difficult relationships between forest policies and traditional cultures. In 1990, 44 member states of the EU developed a body called the “Ministerial Conference on the Protection of Forests in Europe” (MCPFE), which was given the task of implementing policies to safeguard sustainable forest management. Over the last two decades, MCPFE has put forward many important political resolutions, as well as “Criteria and Indicators for Sustainable Forest Management (SFM)” applied by member states to their forests (MCPFE 2003). The three pillars on which SFM are based are ecological values, economic values, and sociocultural values. Vienna Resolution 3, produced by MCPFE during the Vienna conference of 2003, first introduced sociocultural values. However, no political initiatives have yet been developed to implement this resolution. No political action has been taken to enact the guidelines for implementing social and cultural values produced by MCPFE (now Forest Europe) at European level, as the EU Forest Action Plan still does not include cultural values (IUFRO 2007). One of the reasons for this is the difficulty of introducing cultural values without changing previous approaches and existing criteria and indicators of SFM. These indicators are not favoring the recognition of the cultural values of forests (IUFRO 2007). Cultural values are relegated to individual cases identified as “Number of sites within forest and other wooded land designated as having cultural or spiritual values”, in one paragraph of criterion 6, as if the cultural nature of most European forests could be reduced to single elements inside forests. One consequence of the above developments is that forest policies have followed a narrow agenda, mostly addressing nature conservation and timber production. Besides its implication for biocultural diversity, defined as the combination of biological and cultural diversity (UNESCO and SCBD 2014), these approaches obviously hold little regard for the historical landscape and

the related cultural identity of these areas. Unfortunately, these policies have been transferred into forest certification standards, assuring customers that forests are managed according to sustainable management criteria, and also into protection tools.

### The issue of protection tools

At the UN level, there are several programs dealing with cultural heritage. The UNESCO World Heritage List includes rural landscapes in the general category “Cultural Landscape” (Fowler 2003). Of the 43 cultural landscapes included in the WHL, most are rural. The forests in these areas are most often indicated as having natural features, although showing a clear cultural origin. An important case in Europe, among many, is that of the Cinque Terre National Park, an ancient terraced landscape lying along the coast of Liguria (Italy). The area is a UNESCO site included in the category of cultural landscapes. In spite of this, however, it contains a Natura 2000 site (EU Habitat Directive) mainly consisting of shrubland that has colonized former grazed or cultivated land. The restrictions imposed by the habitat directive and by the National Park do not allow the restoration of the previous landscape or any silvicultural management as the site is regarded as natural.

This is not the only instance of considering natural a forest that does not have a natural origin. The UNESCO site of Bourgogne in France shows the same situation. In this case, too, according to the guidelines of ICOMOS developed in agreement with IUCN, alongside the description of the core zone of the WH site, mainly consisting of vineyards, there is a description of a wide buffer zone with a 2000-ha Nature 2000 site, regarded as natural or semi-natural (Association pour l'Inscription des Climats du Vignoble de Bourgogne 2012). In reality, this forest can be described partly as secondary growth on abandoned farmed land, partly as a plantation, and for the rest as forestland still showing the evidence of past and present management practices. Generally speaking, the main issue seems to be the little attention paid to the recognition of traditional forest practices and the way they have affected forests both at landscape scale and at single tree level, even in tools developed for protecting cultural landscapes. This seems to be the case also of more recent tools as the FAO Globally Important Agricultural Heritage Systems project of 2002, where the recent collaboration developed with IUFRO Forest History and Traditional Knowledge, tries to develop criteria suited also for cultural forests.

The above examples occur in sites that have been officially defined as “cultural,” where the forests should accordingly be protected or assessed for their cultural

values. Some other case studies may well represent a quite widespread situation in forested areas that are *not* included among UNESCO cultural landscapes. One of the best-known cases is perhaps the forest of Białowieża in Poland. This forest has long been famous for being the best-preserved natural forest of Europe (Jedrzejewska and Jedrzejewski 1998). Further studies, however, have shown that it has a long history of hunting, fires, beekeeping, and other forms of exploitation by human beings, which have affected all its features (Samojlik 2005). Today it is managed as a natural reserve and is also a Nature 2000 site, but it is far from a purely natural landscape; it should rather be regarded as a testimony of a cultural landscape dating back to medieval times.

The same problem occurs with the Bohemian forest of the Sumava Mts. in Czech Republic, another historical forest where the local National Park has adopted a wilderness approach, despite evidence for a cultural forest landscape having existed for several centuries, where density and species composition have been heavily modified by human beings (Brůna et al. 2013). Ecologists' descriptions of these and other areas commonly call human influence a "disturbance", in the form of logging or other human activities, affecting an ideal state of naturalness with which the present state of the forest is compared. In each of these cases, the reality is that of a cultural forest landscape shaped by centuries of human influence, which should be simply called and managed for what it is.

In order to develop a different approach, suited to stimulating definitions and scientific methodologies taking into account the reality of many cultural environments in the world, in 2010 UNESCO and the Secretariat for the Convention on Biological Diversity (sCBD) produced a Joint Program to promote the links between cultural and biological diversity, recognizing the need to implement knowledge about the long-term interdependence of biological and cultural diversity (UNESCO and sCBD 2010). The recent UNESCO-sCBD Florence Declaration on the links between biological and cultural diversity (UNESCO and sCBD 2014) recognizes that the current state of biological and cultural diversity results from the combination of historical and ongoing environmental and land-use processes, on the one hand, and cultural heritage, on the other.<sup>1</sup> A historical perspective can recognize the environmental systems and processes that shaped each rural landscape within a more general framework of environmental biodiversification. The declaration states that the European landscape is predominantly a biocultural, multifunctional landscape. As such, the European landscape

provides a crucial and effective space for the integration of biological and cultural diversity for human wellbeing. The JP recognizes that landscapes rich in biocultural diversity are often those managed by small-scale farmers or traditional livestock keepers/pastoralists, and thus brings human beings back into an active position as the center of conservation and not as a disturbance factor of an ideal natural state. The declaration also states that the involvement of local communities, and recognition of and respect for their cultural heritage, can assist in more effective management and governance of multifunctional biocultural landscapes and contribute to their resilience and adaptability, as well as to their economic development. The Joint Program is a major step towards a different approach in the development of strategies for the sustainable management of forest having a cultural origin; however, it will require political implementation through strategies and actions that can be developed by international bodies, as UNESCO, CBD, FAO, the European Commission, or by individual countries. The Ishikawa Prefecture in Japan, in collaboration with UNESCO and sCBD, is currently preparing a biocultural platform for better policy development, while the Italian Government has introduced the conservation of biocultural diversity among the objectives of the National Observatory for Rural Landscape.

## Conclusions

Despite the inclusion of cultural value in the environmental agenda and in sustainable forest management, no real action has been taken so far to implement this criterion. So far, this kind of action has been left to local managers who may or may not be concerned with the historical features of wooded areas. Many forest in the world are the result of the integration of human and natural processes in time and space. In a wider perspective, considering the challenges we are facing in relation to the future of the world, it seems wise to focus on finding positive examples of integration between human society and the environment, as it occurs in cultural landscapes, rather than maintaining a separation between the two.

Considering the future scenarios presented by environmental and social changes, the conservation of traditional woodlands and forest management practices, as well as their associated landscape-level adaptations to difficult environmental conditions, should be given priority attention. Efficacy in coping with challenging environmental conditions depends on the interactions between key factors that require careful consideration in order to understand their historical success. Many successes have been achieved through experience and logic that has rarely been formalized by scientists. In traditional rural communities,

<sup>1</sup> The Declaration was presented during the Conference of the Parties of the UN Convention on Biological Diversity (COP 12) in Korea in the month of October 2014.

different types of woodland, from scattered trees in the fields to dense forest cover, provide a variety of products and environmental services. Marginal and apparently non-productive lands, such as areas with low tree cover or shrublands, have been traditionally exploited, providing valuable resources to local populations and helping to reduce external energy inputs. These landscapes are rapidly shrinking through the lack of protection mechanisms and appropriate management.

Landscape is not the result only of the incessant interaction between natural and human factors, but also an expression of the diversity of local populations' cultural and natural legacy and a foundation of their identity, whose preservation is of crucial importance to fight globalization. The theme of landscape highlights the need to defend and strengthen local landscape identities and cultures, to extend and recuperate, also through "landscape-scale planning", measures aimed at promoting care for rural land and reviving appropriate agro-forest practices, especially in the areas most exposed to abandonment. In the European context, this also introduces the theme of land governance. On the one hand, we need to strengthen the role and responsibility of local communities in the knowledge, management and planning of their land; on the other, there is a need for multi-lateral governance to protect extra-local values and common heritage with inclusive, comprehensive and trans-scale approaches. In this framework, a change of direction in conservation policies and also a redefinition of the role of parks and protected areas for contemporary society are required. "Insular" ideas of separatism in conservation should be set aside. We need to accept the idea that one of the purposes of a protected area, sometimes the most important, should be that of protecting cultural values associated to forests.

This requires identifying threats and criticalities, but also challenging policy directives and research approaches, which adversely affect the conservation and management of the cultural values of landscapes. The 2014 Global Landscapes Forum held in Lima (Perù) on December 6–7 finally informed the world about how a "landscape approach" can contribute to sustainable solutions under a wide range of social, environmental, political and economic conditions. Although the focus of the Forum was the REDD+ and climate change, it has clearly highlighted the great potential of a landscape approach.<sup>2</sup> It will be interesting to see whether this new approach will be developed taking into account cultural values, or it will be simply a change in the way we label forest policies.

This suggests that at the Pan-European level it is finally time to apply existing documents, such as the Guidelines for the Implementation of Social and Cultural Values in

Sustainable Forest Management (IUFRO 2007). These guidelines developed a landscape approach for the SFM of the European continent. They also outlined strategies and actions at the regional, national and local level, plus criteria and indicators for preserving cultural values in Sustainable Forest Management, with a broad view reflecting the structure of decision-making of the MCPFE and the various countries joining it. If there is really an interest in preserving these values and in developing policies closer to rural communities, it is now the time to go from simple declarations to actual implementation.

## References

- Agnoletti M (ed) (2006) The conservation of cultural landscapes. CAB International, Wallingford-New York
- Agnoletti M (ed) (2013) Italian Historical Rural Landscapes. Cultural Values for the Environment and Rural Development. Springer, New York
- Agnoletti M (2014) Environmental Thinking and Cultural Values: a reflection on environmental globalisation and the Mediterranean Culture. *Global Environment* 7:257–290
- Andersson R, Östlund L, Kempe G (2008) How to find the rare trees in the forest. Inventory strategies for assessing culturally modified trees in boreal Sweden. *Can J For Res* 38:462–469
- Association pour l'Inscription des Climats du Vignoble de Bourgogne (2012) Les climats du vignoble de Bourgogne. Dossier de candidature à l'inscription sur la liste du patrimoine mondial de l'Unesco
- Balée W (1998) Historical Ecology. Premises and postulates. In: Balée W (ed) *Advances in historical ecology*. Columbia University Press, New York, pp 13–29
- Berger G, Kaechele H, Pfeffer H (2006) The greening of the European agricultural policy by linking the European wide obligation of set aside with voluntary agri-environmental measures on a regional scale. *Environ Sci Policy* 9:509–524
- Brůna J, Wild J, Svoboda M, Heurich M, Müllerová J (2013) Impacts and underlying factors of landscape-scale, historical disturbance of mountain forest identified using archival documents. *For Ecol Manage* 305:294–306
- Council of Europe (2000) The European landscape convention. Strasbourg
- Cunha A, Swinbank A (2011) An inside view of the CAP reform process: explaining the MacSharry, Agenda 2000 and Fischler reforms. Oxford Scholarships on line, Oxford
- European Commission (2013) The common agricultural policy (CAP) and agriculture in Europe. MEMO 13/631
- FAO (2010) Forest Resource Assessment. FAO, Rome
- Forest Europe, UNECE, FAO (2011) State of Europe's Forests 2011. Status and trends in sustainable forest management in Europe
- Fowler PJ (2003) World Heritage Cultural Landscapes. WH papers 6, UNESCO WHC, Paris
- Hamre LN, Domaas ST, Austad I, Rydgren K (2007) Land-cover and structural changes in a western Norwegian cultural landscape since 1865, based on an old cadastral map and a field survey. *Landscape Ecol* 22:1563–1574
- Hibbert C (1987) *The grand Tour*. Methuen Publishing, York
- Höchtel F, Lehninger S, Konold W (2005) "Wilderness": what it means when it becomes a reality—a case study from the southwestern Alps. *Landsc Urban Plan* 70:85–95

<sup>2</sup> <http://www.landscape.org>.



- IUFRO (2007) Guidelines for the implementation of social and cultural values in sustainable forest management. A scientific contribution to the implementation of MCPFE–Vienna resolution 3. IUFRO Occasional paper 19
- Jedrzejewska B, Jedrzejewski W (1998) Predation in Vertebrate Communities. The Białowieża primeval forest as a case study. Springer, Dordrecht
- Johann E, Agnoletti M, Axelsson AL, Bürgi M, Östlund L, Rochel X, Schmidt UE, Schuler A, Skovsgaard J-P, Winiwarter V (2004) History of secondary spruce forests in Europe. In: Spiecker H, Hansen J, Klimo E, Skovsgaard J-P, Sterba H, von Teuffel K (eds) Norway spruce conversion, option and consequences. EFI research report 18, Brill Leiden-Boston, pp25–62
- Krausmann F (2001) Land use and industrial modernization: an empirical analysis of human influence on the functioning of ecosystems in Austria 1830–1995. *Land Use Policy* 18:17–26
- Larsson TB (2001) Biodiversity evaluation tools for European Forests. In: Franc A, Laroussinie O, Karjalainen T (eds) Criteria and indicators for sustainable forest management at the forest management unit level, *EFI Proceedings vol 38*: pp75–82
- MCPFE (2003) State of Europe's forests 2003. MCPFE Liaison Unit, Vienna
- MCPFE (2006) Forestry and our Cultural Heritage. Proceedings of the Seminar, 13–15 June 2005, Sunne, Sweden
- Mottet A, Ladet S, Coqué N, Gibon A (2006) Agricultural land-use change and its drivers in mountain landscapes: a case study in the Pyrenees. *Agric Ecosyst Environ* 114:296–310
- Parrotta J, Agnoletti M, Johann E (eds) (2006) Cultural heritage and sustainable forest management. Proceedings of the Conference, Vol I and II, 8–11 Florence, MCPFE, Warsaw
- Reho M (2006) Le misure per la tutela e valorizzazione del paesaggio introdotte dalla nuova PAC. Valutazioni di efficacia in relazione ai fattori di contesto e alle modalità di gestione. In: Marangon F (ed) Gli interventi paesaggistico-ambientali nelle politiche regionali di sviluppo rurale. Franco Angeli, Milano
- Rounsevell MDA, Reginster I, Araújo MB, Carter TR, Dendoncker N, Ewert F, House JI, Kankaanpää S, Leemans R, Metzger MJ, Schmit C, Smith P, Tuck G (2006) A coherent set of future land use change scenarios for Europe. *Agric Ecosyst Environ* 114:57–68
- Samojlik T (ed) (2005) Conservation and hunting. Białowieża forest in the time of kings. Mammal Research Institute, Polish Academy of Sciences, Białowieża
- Sauer C (1925) The morphology of landscape. University of California, Publications in Geography 2, 2
- Serra P, Pons X, Sauri D (2008) Land-cover and land-use change in a Mediterranean landscape: a spatial analysis of driving forces integrating biophysical and human factors. *Appl Geo* 28:189–209
- UNESCO, sCBD (2010) UNESCO–CBD joint program between biological and cultural diversity. UNESCO, Paris
- UNESCO, sCBD (2014) Florence declaration on the links between biological and cultural diversity. Florence. [www.landscapeunifi.it/images/pdf/UNESCO-CBD\\_JP\\_Florence\\_Declaration.pdf](http://www.landscapeunifi.it/images/pdf/UNESCO-CBD_JP_Florence_Declaration.pdf)