# The conservation of cultural forest landscapes: the Vallombrosa Silvomuseum.

MINISTERIAL CONFERENCE ON THE PROTECTION OF FORESTS IN EUROPE

IUFRO

INTERNATIONAL UNION
OF FOREST RESEARCH ORGANIZATIONS

Task Force on Traditional Forest Knowledge

Research Group "Forest and Woodland History"

# CULTURAL HERITAGE AND SUSTAINABLE FOREST MANAGEMENT: THE ROLE OF TRADITIONAL KNOWLEDGE

Proceedings of the Conference
8–11 June, 2006, Florence, Italy

## Volume 1.

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# PREFACE

The International Conference on *Cultural Heritage and Sustainable Forest Management: the role of traditional knowledge,* held recently in Florence, Italy, was another step in the discussion on the cultural heritage and forests that began with the MCPFE Seminar *Forestry and our cultural heritage* (Sunne, Sweden, 2005). The themes discussed during the Conference clearly illustrated the scope and complex character of the cultural dimensions of forests. The MCPFE has always supported the task of the Conference: to conserve, to enhance and to use our cultural heritage. Meeting colleagues from different countries and cultures was a valuable cultural activity in itself and a pleasant and efficient way to fulfill this task.

The MCPFE approach towards social and cultural dimensions of forest has been demonstrated through a number of ministerial commitments that recognize the importance of these aspects as significant components of sustainable forest management (SFM). The political commitments on increasing awareness of the role of traditional knowledge and practices in the protection of landscapes and conservation of biological diversity were specifically expressed in the Vienna Resolution 3 signed by the European Ministers in the year 2003.

The follow-up action under the Resolution V3 in the MCPFE Work Programme is an elaboration of a publication on material and non-material social and cultural dimensions of SFM. These are contained in these Proceedings of the Florence Conference, which we have the pleasure of presenting. We would like to draw your attention to this publication as we believe that it will considerably enhance the development of common understanding of the cultural dimensions of SFM and strengthen the implementation of overall goals of sustainable development in Europe.

The MCPFE Liaison Unit Warsaw would like to thank the organizers of the Conference: the Italian Academy of Forestry Science, the IUFRO Research Group on Forest and Woodland History (6.07.00), the IUFRO Task Force on Traditional Knowledge, the USDA Forest Service, the University of Florence, and the Ministry for the Policies in Agriculture and Forestry (Italy) for their efforts and time put into such excellent organization of the Conference .

Our special thanks go to the Authors and the Editors, Professor Mauro Agnoletti, Dr. John Parrotta, and Dr. Elisabeth Johann, for their efforts and hard work put into the preparation of these Proceedings. Thanks to their cooperation it has been possible to assemble in this book a scientific report on challenges we all face to ensure that the cultural heritage of forests is carefully managed so that future generations may enjoy it.

We strongly believe that this joint IUFRO/MCPFE publication will be a useful scientific and technical contribution to the MCPFE process.

**Piotr Biorkowski**
Head of the MCPFE Liaison Unit Warsaw

# FOREWORD

More than four hundred million people who live in or around forests depend on this natural resource as their primary source of income and subsistence. Of these, more than sixty million are Indigenous Peoples, whose culture, spirituality and identity are intricately intertwined with the land they inhabit. Traditional forest-related knowledge has long been known to have important implications for forest management and conservation of forest biodiversity, as well as identification of valuable genetic resources. But, as the international community increasingly focuses its attention on achieving the Millennium Development Goals (MDGs) of alleviating poverty and ensuring economic, social and environmental sustainability, the recognition of the importance of traditional knowledge, cultural values, historic perspective and the means necessary for their enhancement will play an increasingly important role in shaping policy as well as forest management practices.

This shift in policy and priorities is evident in the decisions taken by the United Nations Forum on Forests (UNFF) in February 2006. Countries agreed to four Global Objectives on Forests aimed at enhancing sustainable forest management and the contribution of forests to the achievement of the MDGs. Global Objective number two is to "enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest dependent people". In addition, in order to further strengthen the international arrangement on forests and to highlight new priorities, countries agreed that one of the three new principal functions of the UN Forum on Forests will be to "encourage and assist countries… to … increase the area of forests under sustainable management and reduce forest degradation and the loss of forest cover with a view to enhancing the benefits of forests to meet present and future needs, particularly the needs of Indigenous Peoples and local communities whose livelihoods depend on forests".

The achievement of these ambitious goals will require considerable cooperation on the part of both the international community and individual national governments. It will necessitate increased research and sharing of knowledge on how best to ensure secured ownership, customary land rights and clear tenure arrangements for those living in and around forests. And it will challenge practitioners to find new ways of ensuring sustainable forest management, to provide for the social and economic advancement of some of the world's most marginalized people.

The development of a better understanding of the cultural dimensions of sustainable forest management is also one of the most significant emerging policy issues. Particular attention will be needed for the development of an appropriate and balanced toolbox of policies and practices aimed at monitoring, assessing and reporting on the preservation of cultural, historical and landscape values, as well as for better understanding their impact on sustainability.

Università degli Studi di Firenze, the Italian Academy of Forestry Science and the City of Florence have made a major contribution to this discussion by hosting and organizing the recent Conference on the topic. I am also particularly happy that this valuable work will be presented as part of the proceedings of the Ministerial Conference on the Protection of Forests in Europe (MCPFE). As always, we greatly appreciate the work that the International Union of Forest Research Organizations does to further the knowledge base necessary to inform and implement these policy decisions. I am particularly grateful to Professor Mauro Agnoletti, chair of the IUFRO Research group on Forest and Woodland History and John Parrotta, chair of the Task Force on Traditional Forest Related Knowledge, for organizing the Conference that resulted in this publication. I am confident that this valuable exchange of ideas and experiences will contribute significantly, not only to the work being done on this issue in the European region, but to that of the United Nations Forum on Forests, as well.

**Pekka Patosaari**
Director
UN Forum on Forests Secretariat, New York

# INTRODUCTION

**Mauro Agnoletti**[1]

This volume collects papers presented at the conference "Cultural Heritage and Sustainable Forest Management: the Role of Traditional Knowledge" held in Florence (Italy) from June 8th-11th 2006. The conference was organized by the IUFRO[2] Task Force on Traditional Forest Knowledge and the IUFRO Research Group on "Forest and Woodland History", in cooperation with the Ministerial Conference on the Protection of Forests in Europe (MCPFE)[3] and the Italian Ministry of Agriculture, Food and Forest Policies. The opening ceremony was hosted in Palazzo Vecchio, the town hall, thanks to the support offered by the City of Florence, while the technical sessions were held at the Italian Academy of Forestry Science. The organization was also supported by the Italian Forest State Corps, as well as by the Mountain Community of Mugello Valley, which hosted the field trip.

## Institutional involvement

The conference represented a further step in the implementation of the Vienna Resolution 3 of the MCPFE concerning "Preserving and enhancing the cultural dimension of sustainable forest management in Europe". It was attended by over 120 participants from 24 countries, and the opening ceremony by almost 250 people. The institutions represented included the United Nations Forum on Forests, FAO, UNESCO, the United Nations Convention to Combat Desertification, the Council of Europe, the European Commission, the European Environmental History Society, the Italian Ministry of Agriculture, Food and Forest Policies, the Italian Ministry of Environment, as well as the chairs of the Departments of Agriculture and Environmental Policies of the Regional Government of Tuscany. The opening ceremony was jointly organized with the Traditional Knowledge World Bank[4] an organization particularly interested in the conservation of traditional knowledge at world level.

The meeting was also the first regional meeting organized by the IUFRO Task Force on Traditional Forest Knowledge, established during the 22nd IUFRO World Congress in Brisbane, Australia in August 2005. The Task Force is comprised of a core group of members that provide a balanced representation of forest scientists, holders/users of traditional forest knowledge, and other experts from different regions of the world. The establishment of this Task Force was the product of IUFRO's increasing involvement in international forest-related processes and conventions, particularly the United Nations Forum on Forests (UNFF) and the Convention on Biological Diversity (CBD). The collaboration established among the Research Group on Forest History, the Task Force on TFK and the MCPFE is a very important achievement in view of future developments.

## Culture in sustainable forest management: a growing issue

The unexpectedly high number of papers submitted for the conference, along with the diversity of institutions represented, underlines how rapidly attention to the issue of cultural heritage in forestry has grown since the first meeting held only one year ago in Sunne (MCPFE Seminar on Forest and our Cultural Heritage, Sunne, Sweden). This growing interest is due to several reasons related to the historical development of forestry.

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[3] MCPFE (www.mcpfe.org)
[4] Website: http://www.tkwb.org

Modern forestry developed through a process that originated in the Enlightenment in an effort to develop a body of scientific disciplines whose main purpose was to ensure steady wood supplies through time. Despite the attempt to develop a "Social forestry" model in the 1970s, forestry has passed from an initial phase favoring almost exclusively economic approaches to attaining maximum forest rent, to a growing attention paid to the environmental and ecological roles of forests. Both these trends are not only scientific developments but also "cultural approaches" that have not always taken into account the cultural and historical context in which foresters' actions occur, nor recognized that fact that forestry practice is also the result of the systematization of traditional knowledge. Traditional knowledge has greatly contributed and still does to the world's natural and cultural heritage, not only by creating and maintaining landscapes of outstanding beauty, but also by helping to sustain production of multiple goods and services that enhance livelihood security and quality of life. It represents combinations of locally adapted distinctive and often ingenious management practices and techniques that contribute to biodiversity conservation as well as the natural and cultural heritage of the world. Preserving and using traditional knowledge today does not mean only reapplying the techniques of the past, but rather understanding the underlying bases of these models of knowledge. Traditional knowledge is dynamic and adaptive, enabling its users to incorporate innovations that are subjected to the test of time to achieve local socioeconomic and environmental sustainability. As described in the papers presented in this volume these values have often been neglected and are now endangered.

As recently recognized by the UNFF, the forestry world is finally recognizing the importance of traditional forest-related knowledge, and is developing a process that should hopefully be reflected in the enhancement of the criteria for sustainable forest management, and creating very flexible but comprehensive tools that can be applied across the full range of values represented by the forest and woodland areas in the world. There are important reasons why culture is becoming a major issue, particularly for Europe. European forests have been shaped by millennia of human that have affected all their features, and they represent a fundamental part of the cultural heritage of the continent. Their origins and present features cannot be fully understood without an historical perspective. Socioeconomic development, the abandonment of marginal lands, renaturalization, and inappropriate policies are rapidly erasing cultural values and contributing to the globalization of landscape, often simplified into areas either managed for commercial exploitation or areas left to natural evolution. Although, timber production is regulated and the ecological functions and natural values protected by a number of EU directives, cultural values are not preserved by specific European initiatives at management level nor included in certification standards.

Certification was introduced as a market-based effort to foster sustainable management of forests, including aspects such as human rights of indigenous populations, poverty alleviation, and respect for conservation legislation. The initial interest, however, was driven mainly by concerns over the exploitation of tropical forests and reported losses of some species from these forests. These protocols also do not fully identify landscape histories or culturally important landscapes as central considerations for future management decisions. Failure to coherently address culture and history may very well be a growing weakness that will have to be reconciled if the public is to have any confidence in the protocols designed to recognize well-managed forests and, ultimately, sustainable management.

Addressing the need to incorporate cultural and historical factors in sustainable forest management strategies will also integrate forestry with the goals of the European Landscape Convention, signed or ratified by at least 33 countries, which requires signatory states to undertake specific actions at political and planning levels that also affect forest territories. Therefore, it would be wise for the forest sector to include these issues in sustainable forest management strategies; otherwise forestry will remain isolated in political decision-making and development of strategies that will nonetheless affect the sector in the near future. This problem could probably have been given greater emphasis by the recent EU Forest Action Plan and the four axes of the Common Agricultural Policies 2007-2013.

Based on the discussion session on the enhancement of criteria and indicators for MCPFE held at the end of the conference, it is evident that the challenges related to the issue of cultural factors

are significant. In the view of many experts participating in this discussion, they also are important enough to merit further consideration as to the adequacy of existing criteria and indicators to address these concerns. In this regard, several conference participants expressed doubts regarding the introduction of new indicators and the practical and political risks involved. However, it is also apparent that the conservation of cultural and historical values cannot be restricted to the conservation of selected sites of historical importance, as also noted by the MCPFE. In the case of countries like Italy, this would mean preserving almost all the entire Italian forest territory. A further challenge is the need to foster a different attitude among many foresters whose educational backgrounds have been oriented almost exclusively towards production or ecological issues.

The results of the nineteen sessions in which papers were presented offer a set of possible qualitative indicators that could be taken into account for future developments:

- *Conservation of landscape patterns.* This indicator already exists in Criterion 4, although linked to biodiversity, although it has not been implemented. Every European country has its own historical landscapes where forests play their role, and this suggests a need to look at the entire territory in order to assess the functions of forest patches. While some cultural landscapes are characterized by large forest areas, dense and homogeneous forest covers are not always favorable to the conservation of complex fragmented landscape mosaic, especially where agriculture and grazing have important roles. Therefore, a different consideration of biodiversity is needed, understanding that fragmentation is often a value rather than a danger.

- *Conservation of historical land uses.* Historical landscape patterns are created and maintained by land uses often characterized by their long historical presence. They are usually deeply rooted in local culture but are often threatened by changes y change affecting the rural territory. Historical landscapes existing in the European continent can include 1 or 2 forested land use types or as many as 35 in an area of 1000 ha, and are associated with a consequent complexity of management.

- *Conservation of the extension of historical landscapes.* Cultural landscape, as well as sites having historical importance related to surrounding forests, cannot maintain their role and functionality without also preserving a sufficient extension of territory.

- *Conservation of aesthetic values.* The combination of economic, social and environmental factors through time and space has produced landscapes of extraordinary beauty. Afforestation with conifers and tree plantations in agricultural areas are examples of activities that can degrade aesthetic values of cultural landscapes.

- *Conservation of traditional techniques and practices.* These are the basis for effective conservation of cultural landscapes. It is a very broad issue that was addressed by many papers during the conference. Traditional use of trees and other forest plants, forest utilization practices, hunting techniques, various traditional management practices such as the use of fire, are an invaluable heritage that needs to be understood and preserved. Many of these traditional techniques and practices have been neglected, or rejected as degrading to forest resources, by the forestry profession and others concerned with forest resource management and conservation.

- *Conservation of material elements (buildings, structures, tools, etc.).* Europe's forests still present evidence of past human activities and culture. Conservation can be undertaken "on site", as with the conservation of structures for timber transportation or water sawmills existing on the Alps, or in museums.

- *Conservation of cultural trees.* Cultural trees, not only centuries-old veteran trees, but also culturally modified trees for the production of fodder, as well as hedges, tree rows etc., should be preserved.

- *Conservation of cultural traditions.* This refers to immaterial factors, such as traditions linked to ethnic groups or local communities, like those who once managing the Alpine areas, or the Saami culture in northern Sweden. But these could also include public ceremonies, place names, religious ceremonies, etc.

### Considerations for development of an integrated strategy

The next meetings of the MCPFE will discuss the timetable for the future developments, which may include establishment of an expert group for the enhancement of the indicators. However, a reflection on the limitations and opportunities offered by the existing approaches to conservation seems necessary, as discussed by several panelists during the plenary session of the Conference. One of the most common policy approaches to conservation of cultural heritage is to limit those activities that degrade it, as with regulations limiting private and public activities, or through international initiatives like the UNESCO World Heritage List that require a management system to ensure the conservation of proposed landscapes. However, the present recognition of the importance of cultural heritage for economic development, environmental quality and quality of life in rural areas offers new possibilities for active conservation through the European Landscape Convention and the Common Agricultural Policy (CAP), by incorporating cultural heritage into a new model of development.

With the Landscape Convention, the member states have declared that they are "concerned to achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment". The Convention is the first international treaty dedicated to sustainable development that includes cultural dimension. The aims of the Convention are to promote European landscape protection, management and planning, and to organise European cooperation on landscape issues. This means ensuring that due consideration is given to European landscapes through the adoption of national measures and the establishment of European cooperation among the Parties, introducing protection, management and planning rules for all landscapes based on a set of principles.

These strategies could be much more effective if they were integrated with rural development, according to the EU new Common Agricultural Policy (CAP) 2007-2013, and the management of protected areas. Although the introduction of the new rules allowing subsidies to farmers independent of production will probably further favor abandonment of traditional landscapes, the new CAP offers some opportunities through the National Rural Development Plans. These documents are required of all member states by the European Commission, and they represent the framework in which all the initiatives concerning the development of rural territories are planned, supported by the EU funds of the Common Agricultural Policy. One possible example is the case of Italy, where the plan is managed by the Ministry of Agriculture and Forest Policy and has involved the establishment of five working groups, each given the task of addressing one relevant issue. One of these was dedicated to landscape, indicated as having strategic importance. Besides preparing a state of knowledge report for the Italian landscape, the document produced by the working group includes a list of strategies and actions for preserving and developing landscape resources related to each of the main axes in which the Common Agricultural Policy is organized. This would be of utmost importance as well for the new eastern countries joining the EU that still have living cultural landscape and traditional practices.

A parallel strategy to preserve and develop cultural values may be achieved through the management plans of protected areas. Although established with the aim of protecting "natural habitats", many areas of NATURA 2000 and the national networks of protected areas have been placed on cultural landscapes. It is also worth mentioning that a significant part of productive agriculture occurs in protected areas (25% in Italy). Besides the apparent contradictions in this situation, it is evident that the protected areas have both the responsibility and the power to preserve all biodiversity, including that created and maintained by man. This problem has prompted the Regional Government of Tuscany to prepare "Guidelines for the conservation, management and development of landscape resources in the protected areas". A similar approach could be considered at the European level as a means of giving farmers and foresters a role in preserving cultural heritage for future generations, offering economic opportunities for rural communities, and serving the interest of society.

# KEYNOTE PRESENTATIONS

# Traditional knowledge and the European Common Agricultural Policy (PAC): the case of the Italian National Rural Development Plan 2007-2013

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## Abstract

Europe has an extraordinary variety of cultural landscapes, whose origins date back to the continent's earliest civilizations. Although the degree of human influence varies according to demographic, socioeconomic and cultural factors, man has affected all the features of forests and woodlands, modifying their density, structures and species composition, developing distinctive, locally adapted, combinations of management practices and techniques supporting traditional societies. The industrial development affecting forestry and agriculture, as well as the socioeconomic development of rural areas has deeply affected cultural landscapes, slowly degrading their quality. In recent decades this process has been accelerated by inappropriate policies, pointing to a lack of effective research approaches and management strategies to preserve them. In the absence of a real strategy at European and national levels, a chance to affect this trend in Italy was offered by the recent reform of EU Common Agricultural Policy (CAP 2007-2013), requiring the development of a National Plan for Rural Development in each member state, in order to manage the use of European fund. In this framework the Italian Ministry of Agriculture and Forestry has created a working group on landscape, with the goal to prepare a document indicating strategies and actions to preserve and develop landscape resources that are considered of strategic importance for the economic growth and quality of the rural territory. The working group has also considered the importance of, and the need to preserve and promote traditional knowledge in order to protect landscape. The present paper is reporting a brief summary of the chapter concerning the actions promoted by the document.

## 1. Introduction

In Europe the human influence on the original "natural" landscape followed the development of civilization. Both the communities of hunter-gatherers that existed in Sweden in 10.000 B.C. (Selinge 1994) and the Italian settlements of 120.000 B.C. left traces of the long lasting influence of man. But it was not until the second millennium before Christ that we find a development of practices not simply affecting the environment but suited to create cultural landscapes. The Roman conquest of a large portion of the European territory created a long term political organization in which the existing local heritage was affected by influences coming from the southern and the eastern part of the Mediterranean and reflected in the landscape (Di Berenger 1859, Rackham 1995). This process created new forest types, such as chestnut orchards (Pitte 1986), and the introduction of trees in the fields, especially under the form of agroforestry techniques, where coppice woods also played an important role, contributed to the development of complex landscapes, reclaiming large land areas for agriculture and turning them into pleasant places for living (Sereni 1994), without destroying the environemnent, as suggested by some authors (Hughes 2001).

This cultural heritage was still evident at the beginning of the last century, when landscapes were not yet strongly affected by timber production, but sustained by agro-silvo-pastoral societies, for

[1]Chair of the working group on landscape, Italian Ministry of Agriculture and Forestry, National Strategic Plan for Rural Development 2007-2013.

whom forest resources served multiple functions. The persistence of a body of traditional knowledge until the early decades of the 20th century is linked to the relatively slow development of technology in agriculture and forestry in several countries, with traditional techniques still used in the 1960s[2], evidenced for example by the extraordinary variety of tools traditionally used in forestry[3] (Agnoletti 1998). Forestry in particular has shown very slow technological development, mostly due the low value of wood and timber, especially in areas with limited and lower-quality timber resources, or where site conditions prevented efficient mechanization of forest operations. It must be noted that timber has not always been the most important product of woodland areas, as has been documented by research carried out in the field of forest history. There was a long list of products coming out from forests and trees, some of them reflecting common features of many in European landscapes, such as the production of acorns from oak to feed pigs (see fig.1). Charcoal production affected most of European forests, although with different impacts. The number of charcoal kilns existing in 1888 in the area of Falun (Sweden) was about 1 every 12 hectare, but in central Tuscany there were close to 1 per hectare in the countryside surrounding Siena as late as 1954, where all the forests were coppiced for charcoal production. The disappearance of a more varied uses of forests and woodlands is a relatively recent process, triggered by the development of industrial forestry, especially since the end of the 19th century, which spread to the rest of the world thanks to the "imperial forestry" model applied throughout the former British Empire.

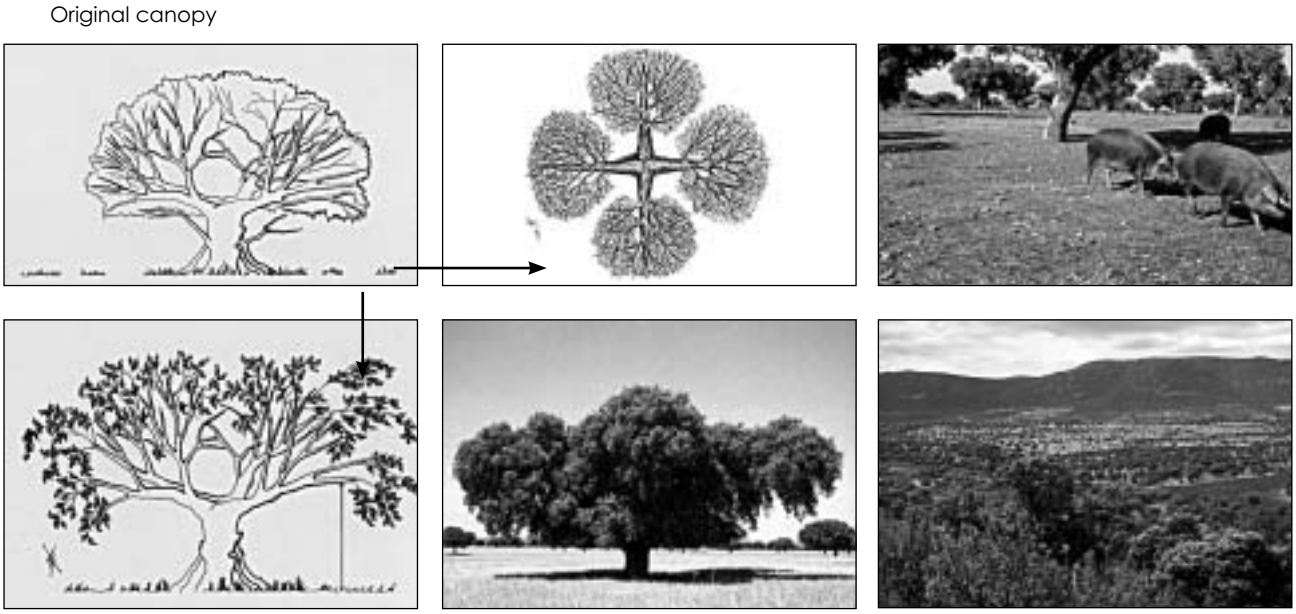


Figure 1. Salamanca, Spain. The management of oaks *(Quercus ilex)* to increase acorn production to feed pigs for meat production dates back to at least Roman times. It involved pruning and pollarding as well as silvicultural techniques. The conservation of this traditional knowledge, not formalized in official forestry books, would not only preserve cultural landscape, but also support an important economic activity linking production of high-quality "typical" products, with promotion tourism and quality of life in rural areas (Photos taken from: Fuentes Sanchez 1994).

## 2. Industrial forestry

The development of scientific forestry emphasized an economic approach to attaining maximum forest rent. The creation of pure, even aged conifer stands in place of mixed broadleaf stands, area regulation, a balanced distribution of age classes in the 'normal' forest ideal, a definite rotation length and the search for a maximum, annual constant yield, became the canons of forest manage-

[2] Water sawmills in Italy were still working in 1960, while the chainsaw was introduced in the same years.
[3] At least 161 different kinds of axes were classified in Italy in 1956 (Giordano 1956).

ment. The spread of conifers transformed the landscape of entire European regions (Agnoletti 2000, Spiecker 2004), replacing practices and traditions dealing with a large variety of woodland types and forest species, and creating monoculture of spruce, fir or pine while reducing old growth especially in areas important for timber production (Axelsson and Ostlund 2000). In Italy afforestation promoted by the state since 1862 has created about one-sixth of the forests existing in 1985 and 60% of the country's conifer forests[4]. The goal of reducing erosion on heavily deforested mountain slopes was accompanied by the intent to increase domestic timber production to reduce imports from abroad[5]. This goal was never achieved. Most of these new forests have not even been managed, but have left their mark in the landscape, evidence of the views and the power of state forestry to affect cultural landscapes. At the global level modern forestry has resulted in an increase in forest plantations, accelerated the loss of traditional knowledge and has favoured simplified forest landscape patterns, often creating conflicts with local populations, and reduced attention to offer a alternative perspectives and approaches towards the role and the use of trees (Arnold and Dewees 1995). The trends in international timber markets, especially after the Second World War, affected the traditional production of timber in the alpine range, which could no longer compete with timber from Scandinavia or other regions outside the EU, mostly due to the costs of logging and transportation, and thereby reducing the utilization of both the ancient and the new conifer forests. Today in the best commercial Italian conifer forests, growing stock is often three times that of 1950, but there is no market for this timber.

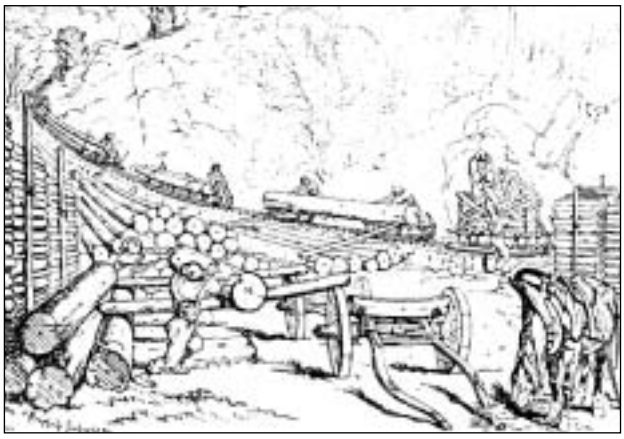

Figure 2.
Vosges mountains (Michiels and Schuler 1857). In all the most important forest regions, complex systems to carry out logging were developed using traditional techniques. These are also part of the cultural heritage expressed by European forests.

## 3. Landscape patterns

The disappearance of complex landscape patterns is linked to the changes that have occurred in the economy and the social structure of rural areas. Industrial products have replaced many of the traditional ones coming from forests and woodlands. Mechanization and organic fertilizers have made the presence of trees in the fields both useless and problematic. The abandonment of many rural areas and the disappearance of traditional agri-silvo-pastoral systems, which occurred after the Second World War, has favoured the extension of forests into former fields and pastures. Forest suited for production are managed with industrial methods, while forests not suited for this are evolving towards natural models, supported also by environmental legislation. This is reducing the diversity of traditional landscape mosaics and leading to a simplification of forest patterns, a trend that has been observed in the United States as well (Foster et al.1998). It is interesting to note how forestry has been able to incorporate the issue of natural biodiversity in the theory and practice of

[4] It is difficult to calculate the real amount of conifer, as many forests have been inventoried as mixed stands. The year 1985 has been chosen because in the new forest inventory (2005, still underway) different formations have been considered as forests areas.
[5] Italy imported about 90% of timber from abroad in 1900, this amount is not changed.

management while there have been a very little recognition of the diversity due to cultural factors. In this respect the development of "material culture" and the birth of many forest museums in the sixties have not really affected forestry, but rather anthropology and ethnography. This has much to do not only with the scientific approaches developed in the last decades, but also with the role of forests today, mostly related to production and ecology.

The monitoring system for landscape quality developed for Tuscany and based on 13 study areas analysed from 1832 to 2004 (Agnoletti 2006) covering 1% of the region (and expected to cover 10% in the next few years), has shown a significant reduction of the diversity of spaces due to the extension of woodlands. The reduction is confirmed by the number of patches, which have decreased 17%, and increased 11% in their average size, since 1832. These data, together with the calculated decrease in Hill's diversity index of 36% over this period, confirm the simplification of the landscape mosaic. This reduction of diversity in relatively small areas makes the present diversity of the regional landscape mostly based on the features of larger subsystems inside the main geographical areas, confirming the change from a fine grained to a coarse grained landscape in many countries (Angelstam,1997).

In Tuscany, as in other parts of Italy, it was possible to find up to 60-70 different land uses in about 1000 hectares in 1832, while in the fields the number of trees could be as high as 150-200 per ha. It has been estimated that in the last 150 years traditional land uses have decreased at the rate of 1 land use every two years. The number of land uses that include trees have decreased from 63 to 6 in several study areas, while 76% of the area is today is comprised of two forest land uses. Thus woodlands have been affected by a simplification of their structure due to the interruption of traditional management practices. The trends reported for Tuscany are quite representative of all Italy, as reported in the study made by the working group on landscape, established for the National Strategic Plan of Rural Development 2007-2013. Italian forests have more than doubled their total extension, according to the different statistical sources used, from about 3.500.000 ha in 1920 to almost 10.000.000 according to the last forest inventory that has included areas usually not considered "forest" (Agnoletti 2006).

### 4. The Italian rural development plan 2007-2013

Despite the evident importance of the rural regions for landscape quality and socioeconomic reasons, we can easily conclude that rural policy in the past decades has favoured the degradation of cultural landscapes. Although the European Landscape Convention, the UNESCO World Heritage List and the recent MCPFE Vienna declaration for the forest sector, as well as other specific documents, clearly addressed these issues, there has not been any real policy to reduce this trend. The importance given to productive issues and technological development, and the favouring of set-aside[6] and tree plantations in areas removed from production, have accelerated disappearance of traditional cultivation practices, homogenizing landscape and sometime introducing new landscape degradation. There has been little recognition not only of the importance of cultural landscapes, but also of the advantages coming from a closer relationship between local landscapes and production of typical products, as well as services supporting agritourism. Comparatively more emphasis has been placed on nature conservation, often identified with landscape conservation. The new EU countries of Eastern Europe will probably experience these same trends, with similar losses of cultural landscapes from their territories with the help of EU directives, while probably creating many protected areas.

[6] The abandonment of agric

In Italy policies promoting the conservation of rural landscapes do not exist. There is, however, an interesting opportunity to address this in the actions and strategies developed for the National Strategic Plan for Rural Development 2007-2013, according to the EU new Common Agricultural Policy (CAP). Although the introduction of the new rules allowing subsidies to farmers independent of production will probably further favor abandonment of traditional landscapes, the new CAP offer some opportunities to promote traditional landscapes through the national plans. These documents are required of all member states by the European Commission, and they represent the framework in which all the initiatives concerning the development of the rural territories are planned, supported by the EU funds of the Common Agricultural Policy. In the case of Italy, the plan is managed by the Ministry of Agriculture and Forest Policy. Five working groups were established, each with the task of addressing one relevant issue for the development of the rural territory. One of these was dedicated to landscape.

The creation of the landscape working group is a real innovation in the way rural development and landscape resources have been perceived and interpreted in recent decades. All the laws and regulations concerning landscape enacted between 1923 and 2004, including those to promote nature conservation, aimed at preserving portions of the territory by limiting human activities that are potentially damaging valuable landscape, and certain land use changes The conservation of traditional knowledge and their landscape can be better achieved, however, not simply placing limits on private or public activities, but by including them in an economic development process in which the advantage of preservation are superior to the benefits of degradation. This can be done with initiatives acknowledging the importance of services linked to landscape and slightly changing the traditional role of farmers often seen simply as "producers". The outstanding growth of employment in "landscape services" in the USA in the last decade (Chang et al 1998) shows the economic potential of service, especially for marginal areas. It is worth remembering that in Tuscany the added value of agritourism is higher than agriculture and forestry production in many rural areas.

The document produced by the working group on landscape presents a state of knowledge report based on a survey at the national scale, but also reports the results of more detailed analyses at the regional level, as the one carried out in Tuscany, discussed above. The document also analyzed forest, agricultural and environmental policies and their influence on landscape, as well as the economic importance of landscape resources. The final chapter of the document includes a list of strategies and actions for preserving and developing landscape resources, related to each of the 4 main axes in which the Common Agricultural Policy is organized. It is the first time that Italy is developing a program like this, and while this is a positive step, there are inherent weaknesses that are related to the current situation of state-region relationships and the structure of the National Plan. Although the main frame of the document relates to all Italy it does not require the regions to accept all the strategies and actions. Therefore, the documents produced by each working group are basically providing a number of possible actions that the regions may choose to include in their rural development plans. This situation is due to the present constitutional framework of the Italian State regulating the relationship between the central government and the regional governments. Another problem is the inadequate coordination between the Ministry of Culture, officially in charge of landscape conservation, and the Ministry of Environment, which is in charge of protected areas, where 20% of Italian agriculture occurs. There is also insufficient interest of several public administrations that are still unaware of the role of landscape resources.

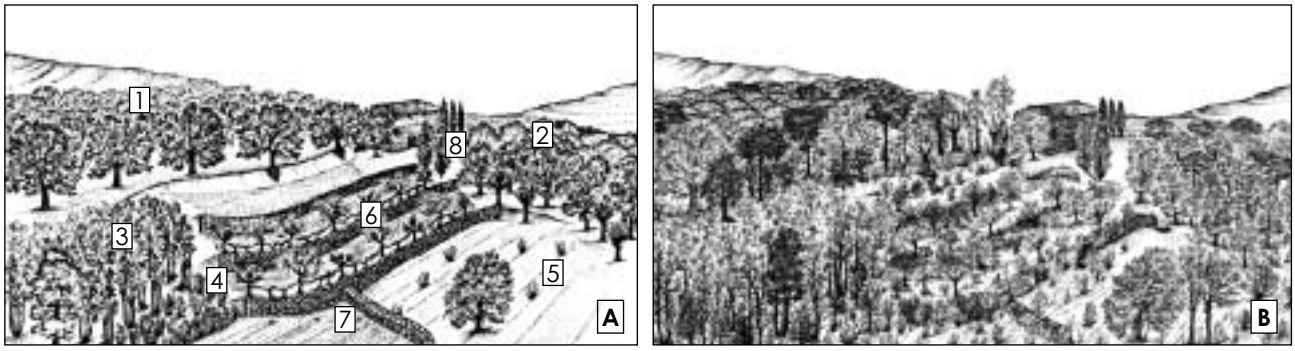


Figure 3. Tuscany, Italy. Picture "A" shows the complex landscape of a typical holding managed by one or more family of farmers in central Italy from 1300 to 1960, according to the sharecrop system. Concerning the landscape patches we have: 1) chestnut grove,2) pastured wood,3) coppice woods,4) shrubland managed as coppice, 5) wood pasture,6) mixed cultivation with vines bound to maple trees,7) sowable land 8) fruit trees,9) pollard trees. Picture "B" shows the effect of the abandonment of the area by man and the disappearance of the traditional landscape mosaic. According to a different point of view this could be of a positive process of renaturalization.

### 4.1. Measures for axis I – "Improving the competitiveness of agriculture and forestry sector"

The strategy developed in this chapter considers the added value represented by landscape resources. The market value of wood products, but also traditional foods coming from the forest, cheese coming from wooded pastures, as well as tourism, can be strongly supported by the added value of the cultural landscapes from which they are derived. This is a crucial factor in the increasing competition at national and international market level. Landscape resources represent a unique factor of competitiveness for each country or region that cannot be reproduced by a competitor in another country. This is particularly important for typical products. A cheese produced in a specific landscape pattern can increase its market value if the producer is also caring for the conservation of the cultural landscape. From this point of view, foods like raspberry, blueberries, honey, chestnut, mushrooms, as well as meat coming from wild animals, sheep and cows grazing in historical landscapes can all be supported. An interesting case of this added value is the role played by woodlands in wine regions. Market studies shows that most of the reason why consumers buy a bottle of wine in Tuscany is not related to quality, but rather to the cultural values represented included in the bottle, recalling historical and cultural factors. In areas like the district of the Chianti in Tuscany is unthinkable to separate the landscape of coppice woods from the vineyards, not only for the stakes produced by these woodlands to support vines, but for the historical association that has always existed between forest and farming. Therefore, preserving historical landscapes is an economic action equivalent in importance to increased or improved production or the quality of wine. The economic actions proposed in this chapter support the conservation of the relations between landscape and products, but also services linked to the maintenance of landscape, offering subsidies not only to farmers but also to administrations and local groups for the promotion of typical products. The initiatives concern also training courses on traditional practices, teaching courses to develop local expertise, support is also given to the conservation of material evidence, rural architecture and the use of traditional raw materials in the farms.

### 4.2 Measures for axis II – "Improving the environment and the countryside"

This axis is characterized by agri-environment and forest-environment measures, payments to farmers for constraints imposed by the NATURA 2000 network of protected areas, and afforestation of non agricultural and agricultural land. In the Italian context this axis has been interpreted

as a way to recover the structure and the patterns of cultural landscapes, with a correct interpretation of the role of nature in the Italian landscape. The actions financed try to counterbalance not only the high rate of abandonment renaturalizing the Italian forests and the countryside, but also the consequences of inappropriate policies that deny the role of traditional forest landscapes for biodiversity. For this reason, and taking into account the rate of abandonment and the continuous growth of forest cover, a further extension of forest through afforestation is not always considered a positive action. Detailed studies based on a multitemporal approach must be undertaken to select the correct measures in order to avoid further degradations of landscape by inappropriate actions. The conservation of landscape mosaics originating from traditional practices linked to the management of wood pastures, chestnut orchards, pastured woods, various forms of coppices, as well as hedges, tree rows and managements of single trees (e.g. pollarding, shredding etc.), or the conservation of veteran trees, are all financed. These measures are at least partly consistent with those of the working group on biodiversity, which also stresses the need to reduce the increase of forest land on pastures and afforestation. However, the scope for restoration of landscape diversity is limited due to the legislation forbidding, or strongly limiting, the possibility of converting woodland to former pasture or field conditions.

Particular attention has been given to the conservation of distinctive, locally adapted, management practices and techniques that contribute to agricultural biodiversity, natural and cultural heritage, and sustained provision of multiple goods and services, food and livelihood security. The measures are organized in 18 actions for agricultural land,4 actions for pastureland and 15 actions for woodlands. Subsidies are given not only to the conservation of specific forest formation having cultural origins, but also to the conversion of woodlands degrading landscape in different land uses, or in different forest types (e.g. the transformation of an afforestation with pine into an oak wood), as well as the opening of "visual cones" to appreciate scenic views. The opportunity to develop effective actions is obviously linked to the local level and the selections of the initiatives to promote, considering also the contradictions with other actions supported.

Figure 4.
Culturally Modified Trees (CMT) for food production (left) and wrappig sinews (right) in the Sami land (Sweden) (Axelsson et al.2001). CMT are a common European heritage, they can be found from Sweden to Sicily.

## 4.3. Measures for axis III – "Diversification of rural economy and the quality of life in rural areas"

The conservation and development of landscape resources can play a crucial role in the Italian context, as most of the appreciation of rural areas by the public and tourists is related not to the environmental quality of single elements (e.g. air, soil, vegetation etc.) but to the integration of economic, social and economic aspects represented by the physical structure of the landscape

and its cultural significance. What is of utmost importance in this context is the recognition of the cultural identity of the places and the development of a strategy to counterbalance globalization forces that are affecting landscape, putting together private and public administrations in order to develop common initiatives. Therefore the actions promote the development of economic activities for the conservation and promotion of landscape resources, infrastructures, services and marketing of landscape resources. In this respect activities concerning the realization of museums or public initiatives recalling traditional practices and economic activities strongly connected to local landscape are promoted. The actions are also supporting studies for management and planning of local landscape, but one of the most innovative tools proposed is landscape certification. Current certification standards, both in forestry or in agriculture, are inadequate to ensure the conservation of cultural landscapes. This initiative is also very closely linked to the current efforts to include cultural values in the criteria and indicators for sustainable forest management (SFM) by MCPFE, trying to resolve some contradictions. Concerning Italy it has been noted that the conversion of landscapes characterized by a relatively low presence of forest and trees, but very well known for their beauty and historical values into forest areas, could formally receive a certification from all the major forest standards existing in the world. The certification proposed does not take into account as a primary objective the quality of air, water or soil, but rather the maintenance of landscape assets representing the cultural identity of the areas. This tool could be applied to promote food and tourism, as well as for sustainable management strategies. There is also the hope to promote new jobs and open new sectors for foresters, not limiting their activity to planting or cutting, but developing the management and conservation of landscapes, as well as services and activities related to the promotion of historical and cultural heritage.

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# The European Landscape Convention

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"The landscape…

… has an important public interest role in the cultural, ecological, environmental and social fields, and constitutes a resource favourable to economic activity and whose protection, management and planning can contribute to job creation;
… contributes to the formation of local cultures and … is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity;
… is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas;
… is a key element of individual and social well-being and … its protection, management and planning entail rights and responsibilities for everyone."

*Preamble to the European Landscape Convention.*

"Promote equality between the public and the expert: the production of knowledge does not mean just scientific production. It must also involve shared knowledge and know-how, and in these traditional and scientific knowledge must recognise each other's worth".

*Conclusions of the report on "Identification assessment of the landscape and landscape quality objectives, using both cultural and natural resources", by Professor Yves Luginbühl, Expert of the Council of Europe (Council of Europe document T-FLOR 2 (2002) 21).*

## 1. Introduction

### 1.1. The Council of Europe and sustainable development

The Council of Europe is an intergovernmental organisation founded in 1949. Its headquarters are in Strasbourg, France, and it has 46 member states[1]. Its main objectives are to promote democracy, human rights and the rule of law and to seek common solutions to the main problems facing European society today. It is active in promoting sustainable spatial development in line with Recommendation Rec. (2002) 1 of the Committee of Ministers to member states on the Guiding principles for sustainable spatial development of the European Continent (PDDTDCE-CEMAT), adopted at the 12th Session of the European Conference of Ministers responsible for

[1] As at 7 June 2006: Albania, Andorra, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, "the former Yugoslav Republic of Macedonia", Turkey, Ukraine, United Kingdom.

Regional Planning (CEMAT) of Council of Europe member states[2]. These seek to protect Europeans' quality of life and well-being taking into account landscape, cultural and natural values[3].

The Action Plan adopted by heads of state and government of Council of Europe member states in Warsaw on 17 May 2005 at the Third Summit has a section on "promoting sustainable development" which reads: "We are committed to improving the quality of life for citizens. The Council of Europe shall therefore, on the basis of the existing instruments, further develop and support integrated policies in the fields of environment, landscape, spatial planning and prevention and management of natural disasters, in a sustainable development perspective".

## 1.2. Origins of the Convention

On the basis of a first draft prepared by the Congress of Local and Regional Authorities of Europe under its Recommendation 40 (1998), the Committee of Ministers of the Council of Europe decided to create a restricted group of experts tasked with drawing up a European Landscape Convention, under the aegis of the Cultural Heritage Committee (CDPAT) and the Committee for the activities of the Council of Europe in the field of Biological and Landscape Diversity Strategy (CO-DBP). As a result of the work done by this group, in which the main international, governmental and non-governmental organisations were involved, the Committee of Ministers of the Council of Europe adopted the final text of the Convention on 19 July 2000. The Convention was opened for signature in Florence, Italy, on 20 October 2000 as part of the Council of Europe campaign "Europe, a common heritage".

## 1.3. Entry into force of the Convention and the state of signatures and ratifications

The European Landscape Convention entered into force on 1 March 2004, which was the first day of the month following the expiry of a period of three months after the date on which ten Council of Europe member states consented to be bound by it. As at 7 June 2006, ten states had signed it and twenty-thee more had signed and ratified, accepted or approved it.

## 1.4. Why a Landscape Convention?

A key factor in individual and social well-being and people's quality of life, the landscape contributes to human development and serves to strengthen the European identity. It plays an important public interest role in the cultural, ecological, environmental and social fields and is a valuable resource conducive to economic activity, notably tourism.

Developments in agriculture, forestry, industrial and mineral production techniques and in regional planning, town planning, transport, infrastructure, tourism and recreation and, at a more general level, changes in the world economy have in many cases led to the destruction of landscapes, or rendered them featureless.

While every citizen must certainly play a part in preserving the quality of the landscape, public authorities have a duty to define the general framework for ensuring this quality. The Convention thus considers that landscape protection, management and planning entail "rights and re-

[2] See also the Ljubljana Declaration on the territorial dimension of sustainable development, in: 13th European Conference of Ministers responsible for Regional/Spatial Planning (CEMAT), Ljubljana (Slovenia),16-17 September 2003, Documents of the Conference, Council of Europe Publishing, Territory and Landscape Series,2005, No 1.

[3] On the subject of natural and cultural heritage, see the other Council of Europe Conventions: Convention on the Conservation of European Wildlife and Natural Habitats (Bern,19 September 1979), Convention for the Protection of the Architectural Heritage of Europe (Grenada,3 October 1985), European Convention on the Protection of the Archaeological Heritage (revised) (Valetta,16 January 1992) and the Framework Convention on the Value of Cultural Heritage for Society (Faro,27 October 2005).

sponsibilities for everyone" and establishes the general legal principles which should serve as a basis for adopting national landscape policies and establishing international co-operation in such matters.

### 1.5. Structure of the Convention

The text of the Convention comprises a preamble and four main sections:

- Chapter I, setting out the objectives and scope of the Convention, plus key definitions;
- Chapter II, stating the measures to be taken at national level;
- Chapter III, stating the basis for European co-operation, the measures to be taken at international level and the role of the committees responsible for monitoring the implementation of the Convention;
- Chapter IV, dealing with procedures for adopting the Convention and related matters.

## 2. Scope of the Convention

### 2.1. Basis of the Convention

#### 2.1.1. Aims of the Convention

The Convention represents an important contribution to the implementation of the Council of Europe's objectives. The member states of the Council of Europe signatory to the Convention have declared that they are "concerned to achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment". The Convention is thus the first international treaty dedicated to sustainable development, including the cultural dimension.

The aims of the Convention are to promote European landscape protection, management and planning, and to organise European co-operation on landscape issues. That means ensuring that due consideration is given to European landscapes through the adoption of national measures and the establishment of European co-operation between the Parties.

The preamble outlines the issues underlying the Convention, emphasising the following points:

- the Convention is part of the Council of Europe's work on natural and cultural heritage, spatial planning, environment and local self-government;
- the concern for sustainable development expressed at the Rio de Janeiro conference in 1992 and later at the Johannesburg Summit in 2002, makes landscape an essential consideration in striking a balance between preserving the natural and cultural heritage as a reflection of European identity and diversity, and using it as an economic resource capable of generating employment in the context of the boom in sustainable tourism;
- the landscape is important as a component of the environment and of people's surroundings in both town and country, whether the landscape in question is ordinary or of outstanding beauty. The public is accordingly encouraged to take an active part in landscape management and planning, and to feel it has responsibility for what happens to the landscape;

- the Council of Europe member states, anxious to promote through international agreements the ideals which are their common heritage, possess a precious asset in the landscapes, and one which needs to be maintained and managed by means of effective international co-operation based on a legal instrument exclusively devoted to landscape.

#### 2.1.2. Relationship with other instruments

The signatory states declare in their preamble that they wish "to provide a new instrument devoted exclusively to the protection, management and planning of all landscapes in Europe". The Convention is thus the first international treaty to be exclusively concerned with all aspects of European landscape. A few international legal instruments are concerned with the subject of landscape, either directly or indirectly. None of them, however, deals directly, specifically and fully with European landscapes and their preservation, in spite of their invaluable contribution to our natural and cultural heritage and the numerous threats facing them.

### 2.2. Scope

#### 2.2.1. Substantive scope

The policies and measures mentioned in the Convention cover all the forms of landscape which countries possess.

The Convention states that subject to the provisions of Article 15, it applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. It thus covers both land areas and water areas, and applies both to inland waters (such as lakes and areas of brackish water) and marine areas (coastal waters and the territorial sea).

What makes the Convention original is that it applies to ordinary landscapes no less than to outstanding ones: it concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes. Landscape is thus recognised irrespective of its exceptional value. This comprehensive coverage is justified for the following reasons: every landscape forms the setting for the lives of the population concerned, affects citizens' quality of life and deserves to be taken into account in landscape policies. Also, urban and rural landscapes interlock in complex ways: most Europeans live in towns and cities (large or small), the quality of whose landscapes greatly affects their lives; and finally, rural landscapes occupy an important place in the European consciousness. Many rural and peri-urban areas in particular are undergoing profound changes and should receive more attention from the authorities and the public at large.

Extending the scope of local authorities' official landscape action to cover the whole of national territory does not mean, however, that the same measures and policies must be applied to all landscapes. These measures and policies should be adaptable to particular types of landscape, which, depending on their specific characteristics, will need various forms of treatment at local level, ranging from the strictest conservation via protection, management and planning to actual creation. These various treatments may pave the way for major socio-economic development of the area concerned.

The Convention is not confined, either, to the cultural or man-made components of landscape: it is concerned with all of the components and how they interconnect.

#### 2.2.2. Geographical scope

The Convention is open for signature by the member states of the Council of Europe. It is provided that after its entry into force, the Council of Europe's Committee of Ministers may invite the European Community and any European state which is not a member of the Council of Europe, to accede to the Convention by a majority decision as provided in Article 20.d of the Council of Europe Statute, and by the unanimous vote of the States parties entitled to hold seats in the Committee of Ministers.

#### 2.2.3. Territorial scope

The Convention states in an article entitled "Territorial application" that any state or the European Community may, at the time of signature or when depositing its instrument of ratification, acceptance, approval or accession, specify the territory or territories to which the Convention is to apply. In addition, any party may, at any later date, by declaration addressed to the Secretary General of the Council of Europe, extend the application of this Convention to any other territory specified in the declaration. It is also provided that any declaration made under the foregoing provisions may, in respect of any territory mentioned in such declaration, be withdrawn by notification addressed to the Secretary General.

## 3. Content of the Convention

### 3.1. Legal obligations

#### 3.1.1. Definitions

The terms used in the Convention are defined in Article 1 in order to ensure that they are interpreted uniformly by everyone concerned with the well-being of Europe's landscapes:

- "landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors;
- "landscape policy" means an expression by the competent public authorities of general principles, strategies and guidelines that permit the adoption of specific measures aimed at the protection, management and planning of landscapes;
- "landscape quality objective" means, for a specific landscape, the formulation by the competent public authorities of the aspirations of the public with regard to the landscape features of their surroundings;
- "landscape protection" means action to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity;
- "landscape management" means action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonise changes which are brought about by social, economic and environmental processes;
- "landscape planning" means strong forward-looking action to enhance, restore or create landscapes.

In each area of landscape, the balance between these three types of activity depends on the character of the area and the objectives agreed. Some areas may merit the strictest protection. At the other extreme, there may be areas whose landscapes are severely damaged and need entirely reshaping. Most landscapes need a combination of the three modes of action, and some of them require some degree of intervention.

In seeking the right balance between protection, management and planning of a landscape, the Convention does not aim to preserve or "freeze" the landscape at a particular point in its lengthy evolution. Landscapes have always changed and will continue to change, both through natural processes and through human action. In fact, the aim should be to manage future changes in a way which recognises the great diversity and the quality of the landscapes that we inherit, and which seeks to preserve, or even enhance, that diversity and quality instead of allowing them to decline.

### 3.1.2. Obligations

At national level. The Contracting Parties undertake to protect, manage and/or plan their landscapes by means of a whole series of general and specific measures at national level, with due regard for the principle of subsidiarity. Each Party implements the Convention, in particular the articles concerning the measures to be taken at national level, according to its own division of powers, in conformity with its constitutional principles and administrative arrangements, taking into account the European Charter of Local Self-Government. The Convention must therefore be implemented at the most appropriate level of government for landscape action and if necessary, local and regional authorities, and groupings of such authorities, must be guaranteed formal involvement in the implementation process.

Where local and regional authorities have the necessary competence, protection, management and planning of landscapes will be more effective if responsibility for their implementation is entrusted – within the constitutional framework laid down in law at national level – to the authorities closest to the communities concerned. Each country should set out in detail the tasks and measures for which each level – national, regional or local – is responsible and should lay down rules for inter-level co-ordination of such measures, in particular where town planning and regional planning instruments are concerned.

The Contracting Parties undertake to implement four general measures:

- to recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity;
- to establish and implement landscape policies aimed at landscape protection, management and planning;
- to establish procedures for the participation of the general public, local and regional authorities, and other parties with an interest in the definition and implementation of landscape policies;
- to integrate landscape into its regional and town planning policies and in its cultural, environmental, agricultural, social and economic policies, as well as in any other policies with possible direct or indirect impact on landscape.

The Contracting Parties further undertake to implement, in a consecutive manner, five specific measures:

- awareness-raising: this involves increasing awareness among civil society, private organisations and public authorities of the value of landscapes, their role and changes to them;
- training and education: this involves promoting: training for specialists in landscape appraisal and operations; multidisciplinary training programmes in landscape policy, protection, management and planning, for professionals in the private and public sectors and for the relevant associations; school and university courses which, in the relevant subject areas, address the values attaching to landscapes and the issues raised by their protection, management and planning;
- identification and assessment: this involves mobilising the interested parties with a view to improving knowledge of the landscapes and guiding the landscape identification and assessment procedures through exchanges of experience and methodology, organised between the Parties at European level;
- landscape quality objectives: this involves framing landscape quality objectives for the landscapes identified and assessed, after public consultation;
- implementation: this involves introducing instruments aimed at protecting, managing and/or planning the landscape.

At international level. The Contracting Parties undertake to co-operate in the consideration of the landscape dimension of international policies and programmes, and to recommend, where relevant, the inclusion in them of landscape considerations. They further undertake to co-operate in order to enhance the effectiveness of measures taken under the Convention, and in particular: to render each other technical and scientific assistance in landscape matters through the pooling and exchange of experience, and the results of research projects; to promote the exchange of landscape specialists in particular for training and information purposes; and to exchange information on all matters covered by the provisions of the Convention.

Transfrontier landscapes are covered by a specific provision: the Parties undertake to encourage transfrontier co-operation at local and regional level and, wherever necessary, prepare and implement joint landscape programmes.

#### 3.1.3. Council of Europe Landscape Award

The Convention provides for a Council of Europe Landscape Award. On proposals from the Committees of Experts supervising the implementation of the Convention, the Committee of Ministers defines and publishes the criteria for conferring the Landscape award of the Council of Europe, adopts the relevant rules and confers the award. These criteria are currently being developed.

### 3.2. Institutional apparatus: the body supervising implementation of the Convention

#### 3.2.1. Provisions of the Convention

The Council of Europe acts as secretariat for the Convention and has structures in which all the Parties to the Convention may be represented.

The Convention states that existing competent Committees of Experts set up under Article 17 of the Council of Europe Statute will be tasked by the Committee of Ministers of the Council of Europe with monitoring the implementation of the Convention.

The Parliamentary Assembly and the Congress of Local and Regional Authorities of the Council of Europe should be involved in the work of these committees relating to the Convention. Given local and regional authorities' increasing responsibilities with regard to the protection, management and planning of landscape, the Congress of local and regional authorities of the Council of Europe may convey opinions to the Committee of Ministers on the reports drawn up by the Council of Europe committees responsible for monitoring the application of the Convention, on the basis of Article 2, indent 2 of Statutory Resolution (2000) 1.

The Convention states that following each meeting of the Committees of Experts, the Secretary General of the Council of Europe will forward a report on the work carried out and on the operation of the Convention to the Committee of Ministers and that these committees will propose to the Committee of Ministers the criteria for conferring and the rules governing the Council of Europe Landscape Award.

### 3.2.2. Implementation of the institutional apparatus

It transpired that it would be easier to achieve the objectives of the Convention if the representatives of Contracting Parties were able to meet regularly to devise joint co-ordinated programmes and to jointly monitor the application of the Convention.

Given the many aspects of the concept of landscape and landscape-related activities, it was decided in July 2000 that the monitoring of the application of the Convention would be entrusted to the Committee for the activities of the Council of Europe in the field of biological and landscape diversity (CO-DBP) and the Cultural Heritage Committee (CDPAT) which work, within the Council of Europe, in the sphere addressed by the Convention and have direct access to the Committee of Ministers. After the Convention came into force, it was felt that in order to carry out this task, the committees could hold joint meetings within the framework of a conference, so that the Convention benefited from an appropriate forum for discussion.

The Declaration of the Second Conference of Contracting and Signatory States of the European Landscape Convention, adopted in Strasbourg on 29 November 2002 and noted by the Committee of Ministers on 28 May 2003, further requested the Committee of Ministers to involve the Committee of Senior Officials of the European Conference of Ministers responsible for Spatial Planning (CEMAT) in the competent Committees of Experts, tasked under Article 10 of the Convention with monitoring its implementation.

After 1 March 2004, the date of its entry into force, it was felt that the Convention needed a structure that would enable it to play its role to the full and contribute to the development in states, of policies reflecting the principles enshrined therein. This structure is in the process of being set up.

## 4. Implementation of the Convention

### 4.1. Conferences of the Contracting and Signatory States to the Convention (2001 and 2002) and the Conference held on the occasion of the entry into force of the Convention (2004)

Two Conferences of the Contracting and Signatory States to the European Landscape Convention were held on 22 and 23 November 2001 and on 28 and 29 November 2002 to bring together, with a view to the entry into force of the Convention, the Contracting and Signatory States, the States invited to sign it and observers.

The three Council of Europe bodies – the Committee of Ministers, the Parliamentary Assembly and the Congress of Local and Regional Authorities of the Council of Europe – were represented, as were the following international governmental organisations. The main international non-governmental organisations specialising or interested in landscape were also represented.

Among other things, these conferences served to:

- promote the signature and/or ratification of the Convention so that it could swiftly enter into force;
- provide legal assistance for the signatory states and Council of Europe member states invited to sign the Convention;
- pave the way for the actual implementation of the Convention following its entry into force.

A major Declaration was adopted at the close of the second conference.

The European Landscape Convention entered into force on 1 March 2004. A Conference was held to mark the occasion on 17 June 2004, at the Council of Europe headquarters in Strasbourg. Participants at a joint meeting of the Cultural Heritage Steering Committee (CDPAT) and the Committee for the activities of the Council of Europe in the field of Biological and Landscape Diversity (CO-DBP), held on 18 June 2004, further adopted draft terms of reference for a European Landscape Convention co-ordination committee and a working programme for 2005.

### 4.2. Activities conducted

The purpose of the activities is to:

- raise awareness of what landscape is and its importance for each individual and society as a whole;
- increase the number of signatures and ratifications of the European Landscape Convention;
- monitor the implementation of the Convention by those states which have ratified it, while inviting other states to join in the efforts;
- support the exercise of good governance based on horizontal (interdisciplinary, intercultural), vertical (national, regional, local) and transversal (public participation and public-private partnership) co-operation; and
- promote European co-operation between states which have ratified the Convention with the participation of other states and the partnership of governmental and non-governmental international organisations.

### 4.2.1. Meetings of the Workshops for the implementation of the European Landscape Convention and the reports prepared

Organised on a regular basis since 2002, the meetings of the Workshops for the implementation of the European Landscape Convention take a detailed look at the implementation of various aspects of the Convention. Special emphasis is given to the experiences of the state hosting the meeting. A genuine forum for sharing practice and ideas, these meetings are also an opportunity to present new concepts and achievements in connection with the European Landscape Convention.

Three meetings of the Workshops for the implementation of the European Landscape Convention have been held so far, in an effort to promote discussion and provide a showcase for practical experiences and examples: on 23 and 24 May 2002 and on 27 and 28 November 2003 in Strasbourg and on 16 and 17 June 2005 in Cork. An exhibition on "Landscape through the eyes of children" was also staged in 2003, at the second meeting of the Workshops.

The following five topics were examined in 2002:

- Landscape policies: the contribution to the well-being of European citizens and to sustainable development (social, economic, cultural and ecological aspects) (Preamble to the Convention);
- Identification and assessment of the landscape and landscape quality objectives, using both cultural and natural resources (Article 6 of the Convention);
- Awareness-raising, training and education (Article 6 of the Convention);
- Innovative tools for the protection, management and planning of landscape (Article 5 of the Convention);
- Landscape award (Article 11 of the Convention).

Three new topics were examined in 2003:

- Integration of landscapes in international policies and programmes (Article 7 of the Convention) and transfrontier landscapes (Article 9 of the Convention);
- Landscape and individual and social well-being (Preamble to the Convention);
- Spatial planning and landscape (Article 5, d of the Convention).

The Workshops for the implementation of the European Landscape Convention held in Cork in 2005 were devoted to the subject "Landscapes for urban, suburban and peri-urban areas" (Article 5, d. of the Convention).

Reports were also published on each of these topics by Council of Europe experts who helped draft the European Landscape Convention. In addition, a report on public participation was drawn up (Article 5 d,6 D of the Convention).

Two further meetings of the Workshops for the implementation of the European Landscape Convention are organised in 2006:

- in Ljubljana, Slovenia, on 11 and 12 May 2006 on "Landscape and society" (Preamble to the Convention);
- in Girona, Spain, on 28 and 29 September 2006 on "Landscape quality objectives: from theory to practice" (Article 6 of the Convention, C, D, E).

### 4.2.2. National seminars on the European Landscape Convention

Intended for states which have or have not yet ratified the Convention, the national seminars on the European Landscape Convention help generate national, interdisciplinary debate on the subject of landscape.

Four national seminars on the European Landscape Convention have been held to date, with declarations or conclusions adopted at the end of each one.

- Seminar on "Spatial planning and landscape", Yerevan, Armenia,23-24 October 2003;
- Seminar on "Spatial planning and landscape", Moscow, Russian Federation, 26-27 April 2004;
- Seminar on "Sustainable spatial development and the European Landscape Convention", Tulcea, Romania,6-7 May 2004;
- Seminar on "The contribution of Albania to the implementation of the European Landscape Convention", Tirana, Albania,15-16 December 2005.

Another seminar is to be held in Cyprus in 2007.

### 4.2.3. Summary descriptive notes on the landscape policies pursued in Council of Europe member states

A document entitled "Summary descriptive notes on the landscape policies pursued in Council of Europe member states", giving the key facts concerning the landscape of the various Council of Europe member states has been produced, together with a synthesis of the information contained in the notes, making it possible to examine the policies currently being pursued in this area across Europe. The notes are designed to be updated on a regular basis.

The following information has been gathered: signature/ratification/approval of the Convention; name and contact details of the correspondent; definition of the term "landscape" in each national language; legal organisation (legal definition of the term "landscape"; constitutional or legislative status, regional laws), administrative organisation (ministry responsible for landscape, responsibilities, documents, representation at the level of regional and local authorities, specific programmes, education syllabi, communication, awareness-raising or information programmes aimed at the public).

### 4.2.4. Naturopa issues devoted to the European Landscape Convention

Three issues of the Council of Europe's Naturopa magazine have been devoted to landscape and the European Landscape Convention.

- "Landscapes: the setting for our future lives", Naturopa, N° 86-1998;
- "The European Landscape Convention", Naturopa, N° 98,2002;
- "Landscape through literature", Naturopa/Culturopa, N° 103,2005 (special issue, European Landscape Convention).

This latest issue brings together texts and pictures from the 46 Council of Europe member states to show that landscape has always had a key spiritual part to play in the lives of individuals everywhere.

4.3. European Landscape Convention web site

The Convention web site is laid out as follows:

- Presentation of the European Landscape Convention;
- State of signatures and ratifications of the European Landscape Convention;
- Implementation of the European Landscape Convention (before and since its entry into force);
- Meetings of the Workshops for the implementation of the European Landscape Convention;
- National Seminars on the European Landscape Convention;
- Reference texts on landscape;
- National policies;
- Network of partners of the European Landscape Convention;
- Landscape calendar;
- Publications;
- Contacts.

It is designed to facilitate the sharing of experience and good practice, stimulate dialogue and provide a showcase for European landscape policies.

## 5. Conclusion

A thoroughly modern concept, landscape combines all four elements of sustainable development: natural, cultural, social and economic. It is also a constantly evolving story, the main thread of which may be grasped by examining the history, characteristics and modern reality of a particular area, and the way society perceives it.

A unique setting and meeting place for populations, landscape is a key factor in the physical, mental and spiritual well-being of individuals and societies. A source of inspiration, it takes us on a journey, both individual and collective, through time, space and imagination.

Any government wishing to implement the principles of good governance needs to give due emphasis to landscape in its national and international policies.

## Traditional Knowledge World Bank for safeguarding ecosystems.

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### Abstract

Traditional Knowledge are ancient techniques and practices of a territory passed on through the generations and used for water harvesting, soil management, use and protection of natural areas, ruralarchitecture and for organising urban centres. They are the historical knowledge of humanity that allowed building architecture and landscapes with a universal value protected by UNESCO in the category of cultural landscapes. An appropriate use of natural resources such as water, soil and energy is made possible by using traditional knowledge that establishes the harmony of architecture with the environment, the symbiosis of the techniques of organisation of space with the traditions, the social habits, the spiritual values and the fusion between practical aspects and beauty. Today, traditional knowledge is in danger and its disappearance would not only cause the loss of people's capability to keep and pass on the artistic and natural heritage, but also of an extraordinary source of knowledge and cultural diversity from which appropriate innovative solutions can be derived today and in the future. UNESCO launched a global programme for an inventory assigned to IPOGEA – Research Centre on Traditional and Local Knowledge. The project gathers and protects historical knowledge and promotes and certifies innovative practices based on the modern re-proposal of tradition as well. The main targets are the firms, the natural areas and the historical centres which will be assigned quality trademarks and acknowledgements of international excellence in production or use of good practices and innovative solutions. Each technology, proposition and experience achieved will provide a spin-off on an international scale and each good practice will contribute to safeguarding the whole planet. Using traditional knowledge does not mean to reapply directly the techniques of the past, but rather to understand the logic of this model of knowledge. It allowed societies, in the past, to manage ecosystems in balance, to carry out outstanding technical, artistic and architectonic work which are universally admired and has always been able to renew and adapt itself. Traditional knowledge is a dynamic system able to incorporate innovation subjected to the test of the long term and thus achieves local and environmental sustainability. The Traditional Knowledge World Bank promotes traditional knowledge as advanced innovative knowledge appropriate to elaborate a new technological paradigm based on the progressive values of tradition: the capability of enhancing a society's internal resources and managing them at a local level; the versatility and the interpenetration of technical, ethical and aesthetic values; the production not per se but for the long-term benefit of the community. Activities are based on the principle according to which each has to enable another one without leaving behind waste; energy use is based on cycles in constant renewal; the purpose, including economic interest, is to protect the ecosystems, the cultural complexity and diversity and all living beings. The project aims to prefigure a new model of development and a technological dimension connected with historical memory. The functioning principle of the traditional systems is based on a strong cohesion between society, culture and the economy. Their efficacy depends on the interaction between several factors which should be carefully considered: aesthetic and ethical values complete the interaction between environmental, productive, technological and social aspects. Traditional techniques, therefore, cannot be reduced to a list of mere isolated technical solutions able to solve a specific problem. To catch the full meaning and importance of traditional techniques they must be always highly contextualised, not only into the local environmental situation, but to a precise historical moment and the complex social construction which originated them.

## Bridging the gap: the IUFRO Task Force on Traditional Forest Knowledge

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### 1. An introduction to IUFRO

The International Union of Forest Research Organizations (IUFRO) is a non-profit, non-governmental network of forest scientists established in 1892. With its headquarters located in Vienna, IUFRO unites more than 15,000 scientists in almost 700 Member Organizations in over 110 countries. IUFRO's Mission is two-fold:

- to promote global cooperation in forest-related research and to enhance the understanding of the ecological, economic and social aspects of forests and trees;
- to disseminate scientific knowledge to stakeholders and decision-makers and to contribute to forest policy and on-the ground forest management.

In pursuing this Mission, IUFRO has adopted a new 2006-2010 Strategic Plan that identifies three strategic goals and related objectives:

*Goal 1:* To strengthen research for the benefit of forests and people

*Goal 2:* To expand strategic partnerships and cooperation

*Goal 3:* To strengthen communication and links within the scientific community as well as with policy makers and society at large

IUFRO's scientific activities are coordinated through 8 Divisions which encompass the full range of topics and disciplines in forest science. The main function of IUFRO Divisions is to support researchers in their collaborative work, and provide an organizational link among Research Groups and their associated Working Parties and also between these Groups and the IUFRO Board.

IUFRO also has several Special Programmes and Projects which are long-term activities aimed at improving networking, research capacities and information exchange. These include:

- GFIS, the Global Forest Information Service, which has become an initiative of the Collaborative Partnership on Forests (CPF);
- IUFRO's Special Programme for Developing Countries (SPDC);
- SilvaVoc Terminology Project (IUFRO's clearinghouse for multilingual forest terminology);

and the

- Special Project World Forests, Society and Environment, which focuses on identifying, monitoring and critically analysing key issues and changing paradigms concerning global forests, in support of sustainable development and the well being of people.

Finally, there are the IUFRO Task Forces. Established by the IUFRO Board for a limited period of time, Task Forces work across technical disciplines to strengthen IUFRO activities on emerging topics or issues and to contribute to ongoing international processes and activities. In the five years ahead,

they will deal with "hot topics" including, among others: forest biotechnology; forest and carbon; forests and water; forest law enforcement, governance and trade; and traditional forest knowledge.

## 2. IUFRO in international forest processes

IUFRO aims at making its scientific work even more relevant to policy and decision-makers by addressing areas of prime concern for sustainable development and human well-being. Currently, IUFRO collaborates with a number of international non-governmental organizations and initiatives as well as inter-governmental organizations, processes and conventions. These include, among others, the United Nations Forum on Forests (UNFF) and its Collaborative Partnership on Forests (CPF); the Convention on Biological Diversity (CBD), and the Ministerial Conference on the Protection of Forests in Europe (MCPFE).

In recent years IUFRO, as a representative of forest science, has succeeded in systematically strengthening its participation in international processes and has provided various thematic contributions. As a member of the Collaborative Partnership on Forests (CPF), for example, IUFRO works with with major forest-related international organizations, institutions and convention secretariats on several key forest science initiatives.

## 3. The IUFRO Task Force on Traditional Forest Knowledge

The IUFRO Task Force on Traditional Forest Knowledge was established during the 22nd IUFRO World Congress held in Brisbane, Australia in August 2005. The Task Force is comprised of a core group of members that provide a balanced representation of forest scientists, holders/users of traditional forest knowledge, and other experts from different regions of the world. We work through regional networks of contributing members from the forest science community as well as individuals and organizations that represent and/or promote the interests of the holders and users of traditional forest-related knowledge.

The establishment of this new Task Force was the product of IUFRO's increasing involvement in international forest-related processes and conventions, particularly the United Nations Forum on Forests (UNFF) and the Convention on Biological Diversity (CBD). It reflects IUFRO's commitment to become more actively engaged in the issues that are most important to the forest-dependent communities, forest managers and decision-makers, and the general public.

## 4. Traditional forest knowledge and its importance

According to the UNFF Secretary-General's Report prepared for the 4th session of the UNFF in 2004, traditional forest-related knowledge can be defined as:

> "a cumulative body of knowledge, practice and belief, handed down through generations by cultural transmission and evolving by adaptive processes, about the relationship between living beings (including humans) with one another and with their forest environment".

In recent years, the importance of traditional forest knowledge has been emphasized by intergovernmental organizations and policy forums, non-governmental organizations, national governments, and others. There are a number of good reasons for this growing interest.

The holders and users of traditional knowledge in many parts of the world are faced with continuing encroachment and/or expropriation of their lands, degradation of their forests, and the erosion of

their cultures, values, and traditional lifestyles. Many communities and organizations are making concerted efforts to preserve this knowledge and the links to the land and to past and future generations that it represents. Further, issues connected to actual or potential expropriation of traditional knowledge by scientists and commercial interests, such as the patenting of medicinal plants that have been used by local and indigenous communities for centuries, have both raised public consciousness about the importance and relevance of traditional knowledge, and sparked contentious debates over intellectual property rights.

The protection and preservation of traditional forest knowledge is an uphill battle for most societies, particularly in the face of rising exploitation pressures on indigenous forest resources, imbalanced power relations that usually put local and indigenous communities at a distinct disadvantage, global cultural homogenization, and many other challenges. There are, however, a few hopeful signs, and emerging opportunities. Over the past decade, the number of initiatives by indigenous peoples' organizations, NGOs, intergovernmental organizations and others related to traditional knowledge, and specifically to traditional forest knowledge, has increased markedly.

Another very helpful trend is the increasing public support, commitment of local and national governments, and the international forest policy community, to principles of sustainable forest management, based on defined criteria and indicators for ecological, social, cultural, spiritual, and economic sustainability. The definition of forest management objectives and forest management practices that meet diverse criteria for sustainability requires collaboration among relevant stakeholders. Further, there is a clear need for decision-makers and forest managers to consider all relevant knowledge about forest ecosystems and the impacts of forest management options in the development of forest policies and operational practices.

## 5. Traditional forest knowledge in global conventions and processes

Traditional forest-related knowledge (TFRK) is recognized and respected in many countries and by the international community as a whole. Indigenous and local communities in many parts of the world have continued their historical and cultural management of forests, and these practices are widely recognized as a form of sustainable forest management in the international arena.

For example, Article 10[c] of the Convention on Biological Diversity (CBD) encourages Parties to "Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements" Likewise, CBD Article 8[j] emphasizes the need to: respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles for the conservation and sustainable use of biological diversity and promotion of their wider application with the approval and involvement of the holders of such knowledge, and encourages the equitable sharing of the benefits arising from the use of this knowledge…

Similarly, the UN Convention to Combat Desertification (1994) requires parties to "…protect, integrate, enhance and validate traditional and local knowledge, know-how and practices" and that "…owners of that knowledge will directly benefit on an equitable basis and on mutually agreed terms" (CCD, Article 18[a]).

The Intergovernmental Panel on Forests/ Intergovernmental Forum on Forests (IPF/IFF) proposals for action include numerous references to Traditional Forest-related Knowledge related to:

- the use of TFRK for sustainable forest management;
- development of intellectual property rights for TFRK and promotion of equitable benefit-sharing;

- technology transfer and capacity-building; and
- promotion of participation of people who possess TFRK in the planning, development and implementation of national forest policies and programs.

### 6. Objectives and activities of the Task Force on Traditional Forest Knowledge

In establishing this Task Force, IUFRO aims to help address the need for a systematic, global, effort to explore and strengthen the linkages between traditional and formal/scientific forest knowledge systems, and to foster effective synergies in forest management applications. Thus, our primary objective is to increase understanding of the inter-relationships between traditional and formal (scientific) forest-related knowledge and catalyze potential synergistic application to sustainable forest management.

The Task Force will: (1) review and synthesize information and experiences on how these two (often quite) different knowledge communities work at various geographic and temporal scales, (2) seek to identify significant knowledge gaps, and (3) to promote research and collaboration between forest scientists and the holders and users of traditional forest knowledge based on trust and mutual respect to address these gaps.

Beginning with this Conference, and continuing over the next 4 years, we will convene a number of regional conferences and workshops that will serve as platforms for dialogue between the forest science community and the holders and users of traditional forest-related knowledge. These conferences will be organized in collaboration with appropriate partners such as intergovernmental, governmental, and non-governmental organizations representing the interests of indigenous peoples, forest research institutes, universities, and others.

Specific issues to be covered in each regional meeting will vary depending on the regional priorities and needs, but most will include the following topics:

- Context and history of the relationship between western scientific forest knowledge and TFK with respect to forest management;
- Application of traditional forest-related knowledge to forest ecosystem assessments and management;
- Local and indigenous community priorities for scientific study (research) in relation to forest resource management;
- Analysis of case studies on successful integration of traditional and (formal) scientific knowledge in forest management activities;
- Experiences and lessons learned related to resolution of conflicts regarding TFK in relation to forest science and forest management;
- Development of good practices for including both traditional knowledge and western science in forestry education, research and forest management activities.

The outcomes of these regional meetings will be used, along with sources of information, to prepare a major State-of-Knowledge report as well as other publications and products from our regional conferences. The State-of-Knowledge report, which we expect to publish in time for the next IUFRO World Congress in Korea in 2010, will attempt to provide a broad overview and synthesis of current knowledge and experience on the topics covered in the regional meetings.

## 7. Concluding remarks

IUFRO is delighted that our hosts, sponsors, and colleagues here in Europe have taken the initiative to organize the first regional conference for the Task Force on Traditional Forest Knowledge: „Cultural Heritage and Sustainable Forest Management: The Role of Traditional Knowledge". The excellent agenda that has been developed for this conference reflects the primary global interests of the Task Force, and particularly the importance of forest history, and highlights the connections between traditional knowledge and cultural heritage and the key forest policy and management issues under discussion in Europe today.

## 8. Acknowledgements

The Task Force would like to acknowledge the financial and administrative support of a number of organizations that contributed to the development and success of this event. We are grateful to the USDA Forest Service (Research & Development branch) and the Liaison Unit of the Ministerial Conference for the Protection of Forests in Europe for their financial assistance, the Italian Academy of Forestry Science for their generous hospitality in hosting the conference, as well as the many organizations and agencies that supported this event in various ways, namely: the University of Florence's Department of Forestry & Environmental Science the City of Florence; the Regional Government of Tuscany's Department of Agriculture & Forestryand the Department of Environment; the Instituto Agronomico per l'Oltremare of the Italian Ministry of Foreign Affairs; and the Italian Ministry of Agriculture, Food and Forestry Policies .

# Theme 1.
# HISTORY OF TRADITIONAL FOREST KNOWLEDGE AND FOREST MANAGEMENT

## Documentary sources for forest history and wood transportation in Veneto (15th-19th century)

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### Abstract

When the Venetian Republic acquired direct dominion over North-East Italy in the early XV Century, the government acquired also direct control over the resources in its new inland territory. The timber resources were previously bought mainly from the Dolomites ruled by the Austrian dukedom or by the smaller seignories of Padua, Verona, Treviso, Trento and Aquileia, or from forests along both the Adriatic coasts.

At the end of the Century special local and central State offices were set up to keep better control of the forests and timber, such as the "Provveditori sopra legne e boschi". The right to dispose of certain hardwood timber used for shipbuilding was reserved to the State and to the Arsenal of Venice, where an increasing effort to build warships required a continuous supply of timber. Venetian patricians and merchants started to favour investments in overland rather than maritime trade. They achieved direct control over sawmills in the Dolomites and other special structures built to process and float the timber, and a special guild of wood-merchant's was founded.

Apart from the economic importance of forests and the timber trade, Venice was well aware that to protect the lagoon and mainland countrysides and towns from spring and autumn floods it was essential to take care of the forests and Alpine environment. Transforming woods into pasture, for example, was strictly prohibited in order to avoid landslides into the mountain streams causing floods (and silting in the coastal lagoons).

And so, together with the need not to depend on foreign sources for raw materials, control of State forests also aimed to keep a hydrogeological balance in NE Italy. In fact the main rivers in this region (especially the Piave, Adige, Brenta and Tagliamento) guaranteed an easy and rapid means of communication and transport between the Dolomites, as producers of raw materials, and the main centres on the plain and the Adriatic coast.

This paper aims to present documents – dating form XV to XIX Century, mostly unpublished – from public records of the Veneto region and especially from ecclesiastical archives in Belluno, Feltre, Treviso, as the local bishops had the right to exact a toll on goods, raw materials and rafts using the waterways. Types of merchandise and raw materials (and different types of raft) were meticulously registered, helping us to reconstruct the number and frequency of journeys and the quantity of timber and planks transported, or used to build rafts of different sizes. The contemporary practice of building and floating rafts on rivers is still carried on for ethnographical and historical reevocations thanks to the sons and nephews of professional raftsmen active until the late 30s of the last Century, and helps us to better understand techniques and customs described in ancient documents.

# Traditional forest management under the influence of science and industry: the story of the alpine cultural landscapes

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## Abstract

Up to the middle of the 19th century the forest was seen as a three-dimensional and multi-layered structure, which multiplied productive space in comparison to fields. The result of the manifold uses was a landscape of rich biodiversity. Several authors have pointed out the importance of traditional multiple use of forests including agro forestry and condemn the term minor forest product utilisation – often used by contemporary forest policy and administration – which denies its former importance and thus neglects its long-lasting influence on the cultural landscape. The loss of biodiversity – as it can be observed today – is closely related to the economic technical strategies of utilising the landscape. This development can be considered in contrast to the demands of society claiming for the keeping of open landscapes and the maintenance of the variety of cultural ecosystems. The paper analyses how rural societies in the past reconciled their demand for wood particularly in the remote Alpine regions, and how these uses related to social and economic power structures. The study investigates how woodland and landscape changed after scientific intervention, how the introduction of modern forestry influenced the correlation of traditional woodland management to political, social, and economic pressure, and also explains why traditional forest-related knowledge has gained increasing importance again in the context of sustainable development of rural areas today.

**Keywords:** multiple uses, utilisation conflicts, woodland management.

## 1. Introduction

Forests and other wooded land cover about 1,000 million ha in Europe (in Austria 47% of the total surface) and are therefore a characteristic element of the natural landscape. The history of Occidental civilization would be unthinkable without the multiple benefits forests offered to society. This is true for tangible and intangible products, social and cultural values, and other benefits of forests. This has also been expressed by the Vienna Declaration and Vienna Resolutions adopted at the Fourth Ministerial Conference on the Protection of Forests in Europe and signed by 40 European Countries and the European Community (Vienna, 28-30 April 2003).

It is necessary to define the terms social and cultural values and cultural heritage in the context of sustainable and traditional forestry. Karl Jaspers (1947) considers all things created by the human genius as culture i.e language, community, society, craft and technique, economy, myths and religion, customs, ethos, institutions, state, policy, law, art, poetry, science, philosophy. They are based on values, particularly on commitments and responsibility. Culture establishes how people deal with each other, with the environment, with the past, the present and with the world in the future. This definition provides the authorization to identify the sustainable management of forests and woodland as culture. Sustainable management of forests and woodlands aim to ensure that the goods and services derived from the forest meet present-day needs, while at the same time securing their continued availability and contribution to long-term development. In its broadest sense, forest management encompasses the administrative, legal, technical, economic, social and environmental aspects of the conservation and use of forests. Several recent international meetings have

suggested that the following thematic elements are key components: extent of forest resources, biological diversity, forest health and vitality, productive functions of forest resources, protective functions of forest resources, socio-economic functions, legal policy and institutional framework. These thematic elements, acknowledged by UNFF, are based on the criteria of the nine ongoing regional/international processes on criteria and indicators for sustainable forest management (Wilkie et al. 2003).[1] Several authors have indicated the change of the original term sustainability in the course of time. That's why Sagl (1993) states that apart from the modification of the term sustainability its original meaning has not changed at all. The essence of all definitions incorporate characteristics of durability, continuity, development of conditions and potentials of any kind as well as its use in the present times and in the future of uncertain duration always keeping in focus the historical context. Taking this interpretation into consideration, tradition plays an important role. It includes the handing over of experiences, competence, knowledge and understanding to the descendants. The relationship between tradition and enlightenment, progress and changing social values is full of suspense (Eisenstadt 1979).

Aim-oriented thinking science, thus came into being in its first form when there was a turn-about from faith and the "irrational". To begin with, science was philosophy, but science was so successful in its endeavour to explain and modify nature, that philosophy was left behind. The origin of science is the instinct of exploring the environment. Some tribes came to realize that knowledge gives controlling power over the environment and consequently makes life easier and that learning what others already know is far more economical than acquiring this knowledge by one's own experience. This genesis of knowledge (knowledge on nature, on humans, religion, ethics, god…) was followed by the condensation and the use of knowledge referring to culture (cultural experience when dealing with nature) and land use systems (oriented knowledge: everyday– and experience-knowledge). Men began to value the aggregate knowledge of all individuals in the community and to feel the need of storing and preserving this knowledge from generation to generation. Under the village-life settings, consensus and acceptability were especially important, where people participated in decisions that determined the development of the society. It was then when a ranking of values within the society became obviously acknowledged also by education, that the transfer of knowledge to the descendents took place (Herzog 1998). However, structures, power, organization, techniques and communication are not static but are variables in the society. They depend on historical changes concerning evolution and/or revolution and the change of values within the society.

## 2. Material and methods

This study deals with the influence of industry and science on traditional management systems related to farm forests. To provide the required information the following issues are emphasized in this paper: characteristics of traditional forest management, impacting factors and frame conditions and the changing demand of industry. Particular attention is paid to the role of forest science in this process, because the so called progress has mainly been influenced by scientific findings.

Political, legal and social framework and other influencing factors have been investigated in two topographically different regions: the alpine region in Carinthia and the hilly region in Lower Austria. The study relies on primary and secondary sources stored in the archives of Klagenfurt (Kärntner Landesarchiv), St. Pölten (Niederösterreichiches Landesarchiv) and Vienna (Archiv der NÖ Agrar-

[1] They were acknowledged by the International Conference on Criteria and Indicators in Guatemala in February 2003 (CICI 2003) and by the FAO Committee on Forestry in 2003. In February 2004, the FAO/ITTO Expert Consultation on Criteria and Indicators recognized that these elements are important for facilitating international communication on forest-related issues. The thematic elements are also used in the FAO-led global forest resources assessment (FRA) as a reporting framework (source: FAO (Food and Agriculture organisation of the United Nations): Towards sustainable forest management. www.fao.org/forestry/site/3861/en website visited May 1st 2006).

bezirksbehörde). The analysis is based on contemporary local, regional and national legislation (from the 14th century onwards) (Johann 1994), documents referring to the effects of legal policy on the local people (cases at court) (Johann 2004 a), contemporary journals and scientific papers referring to forestry, particularly from 1850s onwards (Johann 2002), and regional surveys from the 18th and 19th century. The historical perspective on forest land use is able to provide a frame of reference for assessing current ecological patterns and processes. A general process in history can be retraced in all parts of Central Europe which influenced woodland and landscape, and which is still visible today. Previous studies have documented land use changes and their effects on vegetation patterns (Johann et al. 2004, Johann, 2004b). Comparing the history of human impacts on woodland and landscape the following driving forces have to be taken into account and discussed. The factors can be grouped into four general fields: policy (sovereign, government, administration), economic and social demands in a certain period (farmer, industry), forest management and legal framework (local, regional, national). They are partly interrelated. In different periods different sets of factors seem to have caused the changes. A grouping into different epochs was tackled corresponding to the main influencing factors. Moreover, the visibility in the landscape and the effects on the rural population and its traditional knowledge have been investigated, based on land surveys and travel books from the 19th century.

## 3. Results

The most important results of the analysis of the investigated time spans are summarized in table 1 to 4.

Traditional farm forest management was based on the available local resources. Optimization was carried out by experience and trial (condensation and use of knowledge) and the transfer of the acquired knowledge to the descendants (education). For centuries this tradition was much more important as scientific findings and new technologies. The farmer acquired the bare necessaries of life by diligence, skill and traditional knowledge related to fields, woodland, cattle and alpine pasture. The farmstead was substantially self-sufficient. (Haid 1986). Traditional farming methods in the remote alpine areas of Austria remained relatively unchanged, even in spite of liberalism, until the middle of the 20th century, when unprecedented remarkable structural changes in the living conditions of the rural population took place, also resulting in the abandonment of a considerable number of farmsteads. The results of a modified agriculture were above all the enlargement of the forest surface due to the abandonment of farms situated on unfavourable sites. Scientific-based afforestation programmes have brought about an alteration in the mix of tree species by the promotion of conifers often in combination with the setting up of monocultures. However stands which still retain features of the natural forest vegetation can be found in every part of the country.

In mining districts the importance of wood as a source for energy caused the decline of the "minor functions" not later than the 16th century. In these areas traditional forest management primarily aimed at the maximum of wood production (Pressler's theory of the highest interest). Thereby the manifold needs of the rural population were neglected. It is obvious, that throughout this period the restrictions concerning the multiple use of the woodland was narrowly associated with restrictions concerning the development of society (Schuster 1997).

Table 1. Traditional farm-forest management 1500 – 1820

| Policy | Economic and social demands | Forest management | Legal framework | Effects on landscape and traditional knowledge |
|---|---|---|---|---|
| Promotion of settlements to secure and utilize the living space, strategic considerations, nourishment, subsistence. | Clearing for agriculture (agro-forestry) cattle breeding, firewood and timber of different size and diameter according to the demand such as shingles, water pipes, barrels, other products such as berries, mushrooms, herbs, medical plants, resin. | Sustainable maintenance of the natural resource by limitation of the number of grazing livestock, commitments with regard to the rotation period, ban of protection forests. | Participatory legislation (developed by villagers) Self-government. | Wood was only one part of the benefits offered by the forest. Other products contributed to the rural economy and were important goods derived from the woodland.<br>The utilization resulted in a high diversity in the forest as well as in the field of handicraft and culture. The different kind of uses were balanced. Techniques were handed over to the descendents.<br>Traditional farm forest management based on the available local resources. The optimization was carried out by experience and trial (condensation and use of knowledge) and the transfer of the acquired knowledge to the descendents (education). For centuries this tradition was much more important compared to scientific findings and new technologies.<br>The farmer acquired the bare necessaries of life by diligence, skill and traditional knowledge related to fields, woodland, cattle and alpine pasture. The farmstead was substantially self-sufficient. |

Table 2. Forest management under the influence of industry 1500 – 1820

| Policy | Economic and social demands | Forest management | Legal framework | Effects on landscape and traditional knowledge |
|---|---|---|---|---|
| Promotion of mining and mining industries (interest of the sovereign in the increase of taxes). The importance of wood as a source for energy caused the decline of the "minor functions" since the 16$^{th}$ century. | Demand of the farmstead (timber firewood, other products such as litter, grazing ground), high demand for charcoal and poles, demand of handicraft, high demand for food, temporary clearings for the cultivation of crops (slash and burn). | The goal aimed at was the production of a maximum of wood. Regeneration was left to nature and appeared after 30 to 50 years when grazing did not take place. In some regions artificial regeneration with conifer seeds and seedlings was practiced already in the 18$^{th}$ century. Management was carried out taking into consideration the minimization of logging and transportation costs. Efforts were made to exclude grazing and litter harvesting from the clearcut. Carrying out of forest surveys and inventories. | The goal was the sustainable safeguarding of energy carried out by various laws and orders on local and regional level from the 16$^{th}$ onwards: mandatory of clearcuts, elimination of goats from forest grazing, reduction of size and extent of temporal clearings for crops The government limited the number and production capacity of the iron ore industry to reduce charcoal consumption. | In mining districts the dominance of wood production resulted in: large clear cut areas (up to 400 ha) and in the promotion as well as elimination of certain tree species. At sites suitable for agriculture the forest surface became fragmented.<br>In remote areas beyond mining districts the traditional utilization of woodland prevailed. The result was a landscape of rich biodiversity, high standard and diversity of traditional handicraft knowledge. |

Table 3. Forest management under the influence of science (1820 – 1980)

| Policy | Economic and social demands | Forest management | Legal framework | Effects on landscape and traditional knowledge |
|---|---|---|---|---|
| Liberalization of economy and trade, introduction of steam power, increasing mobility of people by the construction of railway lines, import from overseas impacted agriculture, introduction of mineral fertilizer, substitution of charcoal by fossil fuels. | Decreasing demand for energy due to the substitution of charcoal by hard coal and lignite,<br>high demand for valuable timber,<br>loss of tradition caused by migration,<br>increasing demand for social functions of forests:<br>recreation and protection. | Influence of forest science: Development of the idea of sustainable management,<br>silvicultural methods aimed at clear cutting and artificial regeneration of conifers (forced by the theory of the highest interest). In some regions experiments were carried out concerning silviculture close to nature.<br>Increasing scientific disputes about the advantages of different silvicultural systems. | Forest Law 1852: separation of protection forests.<br>1853 Law and legal commitments concerning forest utilization rights.<br>Reorganization of the public forest administration. | Increase of monocultures,<br>vanishing of broadleaved forests and coppice forests caused by the conversion into high stands of conifers.<br>There was a loss of traditional knowledge and skills noticeably caused by market changes and the decreasing demand for traditional products<br>The loss was intensified by migration and the influence of science: directly by the introduction of "modern" management systems, indirectly by the substitution of wood (iron and plastics) in the production of barrels and baskets, artificial turpentine instead of resin. |

Table 4. Forest management under the influence of society (1980 – )

| Policy | Economic and social demands | Forest management | Legal framework | Effects on landscape and traditional knowledge |
|---|---|---|---|---|
| International agreements, promotion of migration – loss of infrastructure, social perception of the cultural and social values of forests,<br>gap between social awareness and political realization. | Wood and wood products gain increasingly attention as renewable resources and under the aspect of increasing prices for fossil fuels.<br>There is an increasing demand of the urban society for social and cultural values of forests including the intangible goods and services such as protection, recreation, welfare, biodiversity, CO2-sink. | Increasing segregation of forests dedicated to timber production and protection (nature protection, biodiversity, protection of the living space) worldwide<br>In Austria sustainable management is still carried out on the whole forest surface thus being under an increasing economic threat. | Forest Law 1975 renewed 2001,<br>Regional forest planning<br>National Forest program,<br>international and European agreements: EU-Forest strategy, Alpenkonvention. | The maintenance of the cultural landscape is threatened, caused by the migration of the rural population. There is a general loss of biodiversity: shrubs, meadows, alpine pastures, rare plants are disappearing. The cultural landscape can not be preserved without the time-consuming activities set by the rural population and its sustainable management of the landscape.<br>In the case of the decline of traditional products certain forms of utilization vanish, having former shaped the cultural landscape. Thereby also the corresponding skills and knowledge disappear. |

The dominance of wood production led to the promotion as well as to the elimination of certain tree species and resulted in an impoverishment of the landscape. This development was intensified by the implementation of scientific findings from about 1820 onwards (initiated by the German Classical School of Forestry and developed among others by Cotta and Hartig). The tendency was forced by the change of the market with an increasing demand for valuable timber causing even the conversion of former coppice forests into high stands of only one tree species (mostly conifers). The purpose of this kind of forestry was purely economical, nature had to submit to the "art of forestry". With the decline in the abundance of tree species not only the forest stands but the whole scenery changed (Conwentz 1907). Thus also manifold traditional skills and knowledge got lost unintentionally.

## 4. Discussion

The maintenance of traditional forest related knowledge is the focal point concerning the sustainable use of renewable resources. Traditional management systems focus on the local availability of materials. The production is adapted to the natural resources and to the demands of the local market. At present the old skills are disappearing very rapidly. Since the 19th century the ongoing development from handicraft to industrial mass production is one of the main reasons for the decline of the use of traditional materials. Almost unnoticed by society the declining use of renewable materials in the fields where handicraft work dominated is associated with the loss of knowledge of application connected with these materials. The reason why the careful review of traditional but vanishing knowledge of application and on usefulness of the landscape (with respect to medical plants, particular tree species) gains importance is the fact that the declining knowledge of application causes the decreasing use of these materials and in consequence the decline of utilisation (Machatschek 1999). Examples for the downward trend of the utilization-spiral is the declining use of hazel, willow, oak, larch as working material and the decrease of skilled trades such as basket makers, resin collectors (larch and pine), shingle makers, coopers, tanners in Carinthia. Not only a shift in the use of working material (from renewable to fossil) takes place but also a general and irreversible change of operation methods (from handicraft to industrial) and a remarkable loss of traditional knowledge associated with the management of renewable working material (Schnabl 2001). The loss of diversity of ecosystems, we can see today, is partly connected to economic-technical developments, the abandonment of agriculture and the increase of forest areas caused by afforestation programmes carried out with one single tree species (mainly Norway spruce). This development is contrary to the wishes of a society seeking a variety of cultural ecosystems and the conservation of open landscapes.

According to international conventions (FFH-guidelines of EU) the share of natural forests is still relatively high in Austria. More than two third of the forest surface contain elements of the natural vegetation (25% natural and semi natural forests). However, Federal provinces with a high share of mountain forests and a high amount of traditional shaped farm forests show the highest proportion of natural forest ecosystems (Vorarlberg, Tyrol, Salzburg, Carinthia) with a share of more than 40% of natural or semi-natural forests (Grabherr 1998). The historical tie between the sustainable use of woodland and the maintenance of its social and cultural values does not exist any more. Forest science has significantly contributed to this development in focusing on the production of a maximum of valuable timber (mostly conifers) only and by a one-sided interpretation of the term sustainability. However, present-day "close to nature forest management" also includes social and cultural traditional values (apart from economic and ecological targets). Nevertheless, knowledge which was passed down to the descendant for centuries can hardly be reactivated at present times. From the viewpoint of the "modern" market neither traditional handicraft-products nor traditional forest management have a chance to compete with cheap industrial mass production and plantation forestry successfully.

## 5. Conclusions

Each landscape is the expression of the underlying economic system, having left its footprints in the countryside. Until the beginning of the 19th century the knowledge about the best way how to carry out afforestation activities was rather low. From 1820 onwards the influence of forest science was noticeable in the fields of silviculture and – later on – growth and yield, when theoretical findings were implemented in forest management practices. There was a high demand for scientific-based research at the time when forest science became a subject of teaching at the new established university in Vienna (Johann 2002). At the beginning, the goal of timber production of high value, which was aimed at, resulted in the decrease of biodiversity by the increase of monocultures with conifers and the establishment of dense forests. However, at the end of the 19th century the development of the silvicultural theory of "close to nature forest management" also included social and cultural traditional values apart from economic and ecological targets. Analysing the historical development it turns out that forest management hardly ever occurred autonomously. Decisions regarding the management derived rather from goals which were aimed at by the state, the legislator, industry and society. Predominantly the timber market, but also "modern" trends in the field of scientific research influenced forest management systems. Moreover new driving forces apart from economy, such as the recreation – and leisure time – society are increasingly important determinants.

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# La scomparsa dell'utilizzazione dell'erica: un esempio di cancellazione di un paesaggio culturale e dei suoi valori naturalistici

# The cessation of utilization of Erica arborea: an example of cancellation of a cultural landscape and its naturalistic values

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## Abstract

Heather (Erica arborea L.) is a common spontaneous shrub. Since its first development stage, roots grow to form a lignotuber used to obtain pipes. Peloritani Mounts, in Sicily, are the areas of greater importance for quality of this product. Also charcoal and many other products were obtained from the maquis of heather tree in the past. The drastic reduction of these activities was caused by reduced demand of pipes by the market, frequency of wildfires, afforestation. Root extraction of Erica arborea together with pasture by sheep and goats has represented in the past one of the first activities of the local community and, at the same time, it defended from wildfire. The rigorous turnover warranted a permanent cover of the soils and determined the existence of patches at various cover level with positive effects on ecology and landscape. Today wildfires are frequent and after them it would be necessary to remove heath tree in order to favour seed germination but, as most of the maquis of Erica arborea fall into State property areas, it is preferred not to do it. Today social changes and the institution of new protected areas make difficult the use of Erica arborea, as well as the conservation of the related traditional knowledge and their landscapes.

## 1. Introduzione

L'erica arborea (Erica arborea L.) è una arbusto spontaneo che caratterizza numerose formazioni arbustive assieme a calicotome, corbezzolo, ginestra, citiso, lentisco, fillirea, cisti e il sottobosco di sugherete, leccete, querceti e pinete. In Italia la specie è diffusa nelle regioni centrali e meridionali anche oltre i 1000 m di altitudine, ma le zone di maggiore importanza per utilizzazione e qualità del prodotto sono state la Sicilia (Monti Peloritani) sia sul versante tirrenico che ionico, la Calabria (parte bassa dell'Aspromonte, lato tirrenico), la Campania (Cilento), la Toscana (Maremma) e la Sardegna (Mariosa, 1968; Magini, 1957). La sua estensione in passato era superiore all'attuale e tale decremento è da imputare ai rimboschimenti ed ai dissodamenti dei pascoli e degli incolti; Mariosa (1968) già trent'anni fa riteneva che essa fosse diminuita del 40%. La specie predilige un clima di tipo mediterraneo e suoli preferibilmente silicei o siliceo-argillosi ma sempre a ph acido o tendente alla neutralità (Magini, 1967). Le piante che occupano versanti esposti a mezzogiorno hanno ciocchi più sviluppati rispetto a quelle che vegetano a settentrione, ma, solitamente, questi presentano un legno meno compatto e qualitativamente più scadente di queste ultime (Mariosa,

1968). L'erica arborea, inoltre, è poco esigente in fatto di fertilità del suolo, è spiccatamente xerofila e si insedia facilmente anche su suoli aridi. La propagazione può avvenire sia per seme sia grazie alla sua notevolissima facoltà pollonifera.

Sin dal primo stadio di sviluppo l'erica tende ad ingrossarsi nella parte ipogea formando il cosiddetto ciocco o „sbozzo" (nel messinese prende il nome di "pezzola") definito come un lignotuber (cfr. Riba, 1998), che rappresentava e rappresenta oggigiorno il prodotto di maggior rilievo. In passato dall'ericeto si ricavavano anche la ramaglia per il carbone cannellino ed i ciocchi di scarto per il carbone da fucina; per questo motivo l'utilizzazione riguardava l'intera pianta ed era detta nel messinese „a pezzo di carbone". La ramaglia, oggi non ha più nessun valore, e malgrado le prescrizioni di massima e polizia forestale ed altri regolamenti vietino un loro rilascio in campo, le ditte di estrazione, per via dei costi elevati, generalmente non le rispettano. Se l'ingrossamento avviene in senso trasversale il ciocco prende il nome di „femminino", se invece avviene in senso longitudinale il è chiamato „mascolino" (Mariosa, 1968). Il primo, generalmente più grande, presenta esternamente molte protuberanze, internamente ha più venature (i „ciccaioli" del mesinese dicevano che era più „rizza") e la pianta che lo forma tende ad avere più polloni; il secondo, invece, tende ad essere più piccolo, ha poche venature e quindi è "liscio" sia all'esterno che al suo interno, e la pianta presenta uno o pochi polloni. Sullo stesso ciocco, però, si possono anche riscontrare sia parti lisce che con protuberanze. Le venature provengono prevalentemente o dalla biforcazione dei rami o dalle gemme dormienti o avventizie riunite in grandi quantità e che non hanno potuto crescere in modo regolare per effetto del pascolo continuato, delle potature ripetute, dei funghi, ecc.. Le caratteristiche fisico-chimiche ed estetiche rendono il ciocco adatto per lavori al tornio, scatolette, ma soprattutto per la produzione di pipe. Presenta, infatti, non solo la marezzatura, ricca di macchie e vene, ma anche una notevole durezza, una forte torsione della fibra che unita alla ricchezza di anidride silicica (1,80%) lo rende cattivo combustibile. Sono tutti pregi che nel tempo hanno indirizzato la produzione di pipe verso l'utilizzo dei ciocchi d'erica che hanno surclassato altri materiali, quali l'ambra, la schiuma di mare (tufo molle di silicato di magnesio) e la terra cotta (Mariosa, 1968). Il peso minimo per ottenere un abbozzo di pipa è di 0,8 Kg il che condiziona il turno che dovrebbe essere di 20-30 anni (nel 1939 a S. Maria Salina (ME) ne venne estirpato uno di 110 Kg in Mariosa, 1968). Il volume e la forma del ciocco influiscono sulla resa, mentre la consistenza delle fibre, assieme ad altri fattori (es. marezzatura) è determinante per la qualità del prodotto; sta poi al mercato stabilire la domanda alla quale l'offerta deve adeguarsi con il coinvolgimento di tutte le fasi della filiera.

Il fuoco è un nemico giurato dell'ericeto e non tanto per il soprassuolo, che, invece, tende a ricostituirsi velocemente (l'erica è una pirofita attiva), ma per i ciocchi, che assumono una colorazione interna rossastra (termine dialettale usato nel messinese "quagghiate") ed hanno un successivo ingrossamento non uniforme. Le aree attraversate dal fuoco sono, quindi, perse per la raccolta e sarebbe necessario estirparle ("a pezzo di carbone") per favorire il germogliamento dei semi rilasciati dalle piante per poi attendere almeno 12-16 anni prima di ricavare un prodotto idoneo ad essere commerciato. Visto, però, che gli ericeti svolgono anche funzioni protettive e che ricadono per lo più in aree demaniali, si preferisce non intervenire.

## 2. Materiali e metodi

### 2.1. Area di studio

L'area studiata soggetta a dicioccamento ricade sui Monti Peloritani all'interno del Demanio forestale di S. Pier Niceto (ME) (Fig. 1). Nello specifico essa ha una superficie di 160 Ha (10 dei quali non utilizzabili perché precedentemente percorsi da incendio) ed è prevalentemente

occupata da Erica arborea. E' un'area di confine tra i comuni di S. Pier Niceto e Monforte S. Giorgio, nelle località demaniali "P.zo Margiotta" limite Sud, "V.ne Impeli" limite Ovest, "P.zo Cammarone" ad Est e "Izzolino" a Nord; in prossimità di Serra Paglierotto (Sud-Ovest) l'area rientra nella "R.N.O. Fiumedinisi e Monte Scuderi".

Figura 1. Le aree in cui cresce l'erica sono particolarmente accidentate (foto La Mela)

Heath tree areas on Peloritani mountains are particularly uneven (photo: La Mela)

## 2.2. Fasi di studio

La filiera è stata seguita interamente, ad eccezione dei lavori in raffineria, nel periodo compreso tra il 2002 e il 2005 e comprende: 1) le fasi che anticipano la concessione del diritto di estirpazione (stime quantitative e monetarie del prodotto, ecc...) e l'emissione del bando; 2) operazioni di campo (estirpazione dei ciocchi, loro conservazione e trasporto); 3) lavorazione in segheria (taglio in abbozzi, selezionatura, bollitura, riselezionatura, essiccazione e imballaggio).

## 3.1. Risultati e discussione

### 3.1.1. Fasi preliminari all'estirpazione

Nel dicembre del 2002, l'Ufficio Provinciale dell'Azienda Regionale Foreste Demaniali di Messina indette un'asta pubblica per vendere il ciocco maturato su parte dell'ericeto (160 ettari) del Demanio Forestale di S. Pier Niceto esteso per 1.463 Ha e ricoperto per il 50% da Erica arborea, costituito a seguito dell'entrata in vigore della L.r. 18.2.1986 n°2. Per la stima di tale ericeto l'Amministrazione forestale, avendo dovuto determinare il prezzo a base d'asta, procedette alla delimitazione di 30 aree di saggio (una ogni 5 Ha circa), di forma quadrata e di superficie di 400 mq. In tali aree, scelte in funzione soprattutto della fertilità e profondità del suolo, venne effettuato il dicioccamento estirpando e pesando solo quei ciocchi con idonee caratteristiche commerciali. Ottenuti i valori di tutte le aree di saggio (oscillanti tra 20 e 440 kg) venne calcolata la media estraibile da un ettaro (41 q) ed infine il totale stimato per l'intera superficie (6187 q). Da indagini di mercato esperite in zona ed anche nella vicina Calabria venne stabilito un prezzo medio unitario per chilogrammo di ciocco di 0,093 € e quindi il prezzo a base d'asta (57.539 €). Il contratto stipulato il 16-12-2002, aveva una durata triennale e conteneva inoltre le norme per una corretta utilizzazione dell'ericeto. Tali norme erano dettate dalle Prescrizioni di Massima e Polizia Forestale vigenti in provincia di Messina e vietavano: di arrecare danni alle piante forestali presenti, di utilizzare piante non idonee, di aprire strade senza debita autorizzazione, di rilasciare resti di piante utilizzate sul letto di caduta, di lasciare buche. L'acquisto del diritto di estirpazione ed utilizzazione dell'ericeto può essere fatta solitamente da due tipi di imprese ben di-

stinte tra loro. Il primo, meno importante, è dato da piccoli imprenditori che, generalmente su limitate superfici di ericeto, compiono in proprio le operazioni di campagna e vendono poi i ciocchi alla segheria in cui si procede alla loro trasformazione in abbozzi per pipe. Nel secondo tipo compare un imprenditore proprietario di segheria e nello stesso tempo imprenditore forestale che oltre a curare l'estirpazione trasforma il ciocco in abbozzi e vende questi ultimi alle raffinerie in cui gli abbozzi sono rifiniti per l'ottenimento delle pipe. Nel caso oggetto di studio, la ditta aggiudicataria del diritto è stata la segheria "La radica" sita in Antonimina (RC), la quale, però, ha affidato il lavoro di campo a persone del luogo.

Figura 2. Alcuni degli attrezzi utilizzati per l'estrazione del ciocco d'erica (foto La Mela)

Some tools used to extract heath tree roots (photo: La Mela)

### 3.1.2. Operazioni di campo

Tutte le fasi sono state effettuate dai cosiddetti "ciccaioli", persone specializzate nella raccolta e conservazione in campo delle "pezzole". L'impresa che aveva in gestione i lavori di estrazione dei ciocchi era costituita da due squadre di 3-4 operai ciascuna, molto qualificati e con buone conoscenze dei luoghi trasmesse loro dai genitori. L'utilizzo di mezzi quali accette e motoseghe, per tempi prolungati (anche 8 ore giornaliere), su terreni molto acclivi ed in condizioni climatiche talora estreme (solitamente caldo eccessivo) rendono questo mestiere pesante e rischioso.

Dall'aspetto della pianta, dalle caratteristiche del terreno e dall'esposizione del versante i ciccaioli riescono a distinguere una pianta con ciocco "femminino" da una con ciocco "mascolino". Individuata la pianta ne tagliano con una motosega o con l'accetta i polloni e mediante l'utilizzo di uno speciale piccone a due lame („manescure" o "zappaccetta") (Fig. 2), di cui una disposta a zappa per liberare il ciocco dal terreno e l'altra a forma di scure per tagliarne le radici, procedono all'estirpazione (Fig. 3).

L'estirpazione può essere effettuata in tutti i periodi dell'anno. Da un punto di vista ecologico è più indicato il periodo post-maturazione dei semi (da giugno in poi), per favorire una rinnovazione di tipo gamica; mentre se si considera la praticità operativa, dipendente dalle condizioni meteo e dalla più facile conservazione in campo dei ciocchi, i periodi ideali sono quelli primaverili ed autunnali. I ciocchi di notevoli dimensioni o con particolari segni visibili all'esterno venivano, sempre utilizzando la lama del piccone e seguendo le venature e l'andamento delle fibre, ridotti in parti più piccole, ossia "spicchiettati"; in tal modo si constatava la qualità della massa legnosa interna. Eventuali parti attaccate da marciume o tarli, o che inglobavano pietre o terreno, erano eliminate o con un'apposita accetta a due lame ("accetta di pulire" o "accetta a doppio taglio") o mediante una roncola. Gli sbozzi, puliti e sfaccettati, venivano posti in buche scavate nel terreno e ricoperte con felci e/o rami; il tutto per evitare perdite repentine di umidità e conseguenti facili fessurazioni, specie nelle

pezzature più piccole. Altri cumuli, di maggiori dimensioni e posti in luoghi ombreggiati, si formavano sulle strade camionabili, ed in questo caso il mantenimento dell'umidità era assicurato da uno spesso strato di coperte frequentemente bagnate ("mallarate"). Per il trasporto dei ciocchi dal luogo di estrazione alle strade camionabili gli operai utilizzano piccoli trattori ("cariole idrauliche") dotati di cingoli gommati e con una carreggiata limitata (per avere accesso a stradine piccole e scoscese), ed una portata massima di 350 Kg.

Giornalmente un bravo operatore riusciva ad estirpare più di 20 ciocchi, per un totale in peso di circa 80-100 Kg. Il proprietario della segheria pagava 0,75-0,80€ per chilogrammo di ciocco trasportato su strada camionabile, con un conseguente ricavo per l'operaio che variava dai 60 agli 80€ al giorno.

### 3.1.3. Lavorazioni in segheria

Quando il quantitativo di ciocchi era tale da giustificare il trasporto in segheria, il prodotto veniva caricato su camion e ricoperto con speciali tele; il costo di tale trasferimento in Calabria si aggira su circa 9 euro a quintale. Il carico, giunto in segheria, viene sistemato in cumuli e, nell'attesa di essere lavorato, bagnato più volte (in estate, e nelle ore più calde anche ogni ora e mezza!) (Fig.4).

La lavorazione successiva del ciocco richiede specifiche capacità da parte dell'operaio ("segantino"), in quanto la radice dell'erica presenta pregi e difetti non facilmente individuabili. Nella segheria sita in Antonimina (RC), lavorano 3 segantini e 2 manovali. I primi, mediante l'utilizzo di una sega circolare, dividevano e tagliavano gli sbozzi in „abbozzi", costituiti da una parte denominata „testa" a forma di prisma rettangolare, con quattro facce e una base che nella successiva lavorazione in raffineria darà il focolaio, ed una chiamata „coda", più ristretta e simile ad un prisma trapezoidale che avrebbe costituito la porzione di pipa che va dal focolaio al punto di attacco del bocchino. In una giornata un segantino riesce a segare fino a 300-350 Kg di ciocco, di cui circa il 60-70% costituisce lo scarto di lavorazione. Si rimane sorpresi dalla velocità e dalla lucidità con la quale i segantini trasformano grossi e piccoli ciocchi in abbozzi geometricamente simili ma di diverse dimensioni. I valori di altezza, spessore e lunghezza dell'abbozzo e le forme („marsigliese"– per pipe lunghe e diritte, „rilevata „– per pipe corte e curve) sono condizionate da numerosi fattori, quali: grandezza del ciocco, presenza di particolari difetti, andamento delle fibre e delle venature. Un bravo segantino, malgrado tutto, riesce a tirar fuori dei semilavorati di categorie e qualità più consone alle richieste del mercato. Proprio sui termini categoria e qualità ruota, appunto, il mercato degli abbozzi. La categoria è determinata dalle dimensioni (altezza, spessore e lunghezza) del semilavorato, misurate con un apposito strumento metallico che dà i valori in pollici (Fig.5); tali valori vanno poi comparati a quelli di particolari tabelle formulate dal mercato, e comuni a tutte le segherie. La qualità è un parametro più difficile da stabilire. Per far ciò, si bagnano gli abbozzi ad uno ad uno per esaltarne i disegni delle venature, si guardano tutte le facce e si valutano sia i pregi (venature a fiamma, a granata, a occhio di pernice, ecc...) quanto i difetti (parti tarlate, riscaldate, puntinate, ecc...). Nel complesso si hanno 28 categorie indicati da particolari codici (es. R1, R2¼, M1, ecc…) e 5 tipi di qualità (extra-extra, extra, prima, misto e seconda) (Mariosa, 1968). Chi determina l'assegnazione alle classi di qualità, e lo fa prima della bollitura dei pezzi, è sempre un operaio specializzato che sa che il suo lavoro, detto „selezione in bianco", è alla base della serietà della segheria stessa nei confronti degli acquirenti (raffinerie, piccoli artigiani, semplici appassionati) degli abbozzi. Successivamente gli abbozzi appartenenti alla stessa qualità ma di categorie diverse vengono poste in vasche, capaci ognuna di contenere 10-15 quintali

di prodotto, e fatti bollire da 12 a 18 ore con fuoco alimentato dagli stessi scarti della segagione. Scopo della bollitura è di allontanare l'abbondante tannino (detannizzazione) (un tempo utilizzato: Mariosa, 1968) contenuto nella massa legnosa e di conferire alle fibre del legno una maggiore compattezza. Spenta la caldaia si aspetta che la temperatura dell'acqua scenda sui 30-40 gradi ed a questo punto gli abbozzi si accumulano, per almeno 8-10 giorni sotto copertura di sacchi, fino alla comparsa di un particolare fungo. Si procede, quindi, alla loro essiccazione che, in base al periodo ed alla conseguente temperatura, solitamente non superiore ai 30°C, può richiedere da 60 a 90 giorni. Tale processo determina la scomparsa delle efflorescenze e porta ad avere un prodotto leggero di color mattone e pronto ad essere imballato. Prima però si effettua un'ulteriore selezionatura, detta „selezione in nero" o „riselezionatura", per determinare le varie categorie e scartare i pezzi spaccati, lesionati o comunque non idonei.

Il prodotto, infine, viene conservato e venduto in sacchi di juta, ognuno dei quali presenta esternamente due codici, uno per la categoria ed uno per la qualità del prodotto; una volta riempiti, il loro peso non varia con la categoria, infatti, se il segantino era stato bravo a „placcare", ossia a rispettare le proporzioni tra altezza, spessore e lunghezza dell'abbozzo, tipiche della categoria, si aggira sempre sui 104 kg. Anche in questo caso vi sono particolari tabelle dalle quali si può dedurre il numero di dozzine di abbozzi necessario, in base alle categorie, per ottenere il peso di una „balla" di pipe (104 kg circa).

Il prezzo di una balla di pipe varia al variare sia della categoria che della qualità ed è regolato dall'andamento del mercato. Orientativamente la qualità „extra" è venduta a 800 euro, la „prima" a 400 euro e la „misto" a 250 euro. Oltre alle grandi raffinerie, vi sono piccoli artigiani o appassionati che comprano pochi abbozzi, di solito le „placche" (riconoscibili dalla presenza della corteccia), che rappresentano i pezzi più pregiati, anche a 8-10 euro cadauno.

## 4. Conclusioni: una filiera in declino, un paesaggio e una cultura materiale che spariscono

Mariosa (1968), rilevava la presenza sul territorio nazionale di ben 58 segherie (23 delle quali in Calabria ed altre 6 in Sicilia) e 10 raffinerie (tutte dislocate nella Lombardia). Per quanto riguarda le raffinerie, quelle di maggiori dimensioni oggi si trovano in Albania per il minor costo di manodopera, e quelle più piccole, seppur ben organizzate ed alcune di fama internazionale, in Italia ("Amorelli" di Caltanissetta); a fine '800 a Messina operava addirittura una fabbrica a vapore per la lavorazione delle pipe (IRCAC, 1988). Attualmente in Sicilia non esistono più segherie e in Calabria il loro numero è sceso a 4. La decadenza di un settore, che fino a poco tempo fa trainava l'economia di molte aree meridionali, è da imputare alla minore richiesta del mercato americano, alla campagna antifumo, all'assorbimento da parte dell'industria di molti giovani meridionali, al fattore antropico sul territorio (incendi ripetuti e rimboschimenti), alla durezza dei lavori manuali ed alla attuale crisi economica (si spende meno per beni di lusso come le pipe). Sta sparendo una attività che ha interessato vaste aree del Mediterraneo dove però da tempo è cessata come in Corsica (Penberthy, 1914) e che ha permeato la vita di intere regioni (il Decreto Legislativo del 26 marzo 2001, n. 151 – Testo unico delle disposizioni legislative in materia di tutela e sostegno della maternità e della paternità … riporta nelle "Tabelle delle industrie aventi disoccupazione stagionale o normali periodi di sospensione …" la provincia di Livorno tra quelle in cui si applica il periodo non indennizzabile) e la cui storia è ancora da scrivere. Una attività che ha modificato e costruito un paesaggio peculiare, l'utilizzo dell'ericeto per ricavarne ciocco, sui Peloritani Orientali, è stata da sempre, infatti, una pratica selvicolturale di rilievo.

E' significativo come nei Peloritani e presso le segherie della vicina Calabria si conservi ancora una cultura materiale ricca e praticamente immutata da quando venne descritta dal Mariosa (1968), probabilmente se non si blocca il declino questa sparirà repentinamente come sta avvenendo per altre attività (La Mantia, 2006). Una sorte analoga ha interessato l'altra erica (Erica scoparia) con analoghi effetti ecologici e paesaggistici (Agnoletti, 2002). L'estrazione del ciocco d'erica, unitamente agli allevamenti ovi-caprini, per alcuni comuni ubicati sulla catena dei Peloritani Orientali (Monforte S. Giorgio, S. Pier Niceto, Rometta, ecc...), ha rappresentato nel passato uno dei settori trainanti dell'economia locale ma anche elemento caratterizzante la cultura materiale dell'area. Lo testimonia la presenza diffusa di piccoli artigiani o semplici appassionati ad es. a Pellegrino, una piccola frazione di Monforte S. Giorgio, i quali sporadicamente si recavano negli ericeti, prelevavano pochi ciocchi e li trasformavano in piccoli fiaschi, posacenere, piccoli barili (Fig.6), ecc..., per poi venderli o usarli come oggettistica nelle loro case.

Non è un caso che le utilizzazioni interessino questa area ed in passato buona parte dei Peloritani, visto che, per caratteristiche geologiche, pedologiche, climatiche e storiche, rappresentano uno dei luoghi, in Italia, più vocati per l'ottenimento di un prodotto di elevata qualità (…the Sicilian root, which is the first quality: Penberthy, 1914). I suoli bruni acidi, qui presenti, sono il risultato della degradazione delle rocce metamorfiche ed il mantenimento della loro acidità è legato sia alla presenza dell'ericeto, favorita dall'utilizzazione razionale fatta dall'uomo, che alle elevate precipitazioni meteorologiche (processi di lisciviazione). Alle ideali condizioni ambientali va aggiunta anche la vicinanza di piccoli comuni montani (Monforte S. Giorgio, Rometta, S. Pier Niceto ed altri) che in passato hanno posto alla base della loro economia l'utilizzazione dell'erica secondo rigorosi turni e gli allevamenti ovi-caprini. A tale riguardo Giacobbe (1952 in Mariosa 1968) metteva in evidenza che " … il pascolo ininterrotto, esercitato per decenni e decenni, e sospeso appena 1-2 anni dopo il taglio della frasca, non riesce mai a distruggere l'ericeto, come dimostrano gli esempi delle vaste superfici boscate ad erica dei monti Peloritani, sulle quali, da secoli si esercita il pascolo caprino, tanta è la rusticità e la vitalità di questa pianta". Studi recenti (Gonzáles Hernández e Silva-Pando, 1996; Bartolomé et al., 2000) confermano la capacità di resistenza dell'erica al pascolo che inoltre limita fortemente l'affermazione delle piantine di specie arboree che emergono numerose a seguito dell'apertura del soprassuolo, e rappresenta un valido alleato dell'ericeto ed un nemico della successione.

Figura 3. Piccolo ciocco al momento dell'estrazione (foto La Mantia)

Small heath tree "ciocco" extracted from soil (photo: La Mantia)

Figura 4. Cumulo di ciocchi in segheria (foto Tomeo)

Mound of heath tree "ciocchi" in a saw-mill (photo: Tomeo)

Figura 5. Strumento per la determinazione delle categorie degli abbozzi (foto Tomeo)

Tool to classify "abbozzi" roughdrafts (photo: Tomeo)

Figura 6. Alcuni oggetti realizzati da artigiani locali (foto La Mela)

Some items made by local craftsman (photo: La Mela)

Da recenti iniziative sulla istituzione di aree protette in questa area giungono segnali di preoccupazione per l'attività di estrazione dell'erica ritenuta a torto una fattore di squilibrio. Probabilmente la situazione attuale, con turnazioni imprecise e utilizzazioni fortemente condizionate dagli incendi rendono fragile il sistema. Bisognerà pensare a metodi che consentano di conservare questa attività per il vantaggio che in termini ambientali, paesaggistici e culturali ne può ancora derivare.

## 5. Ringraziamenti

Un sentito ringraziamento per le informazioni fornite ma ancor più per la loro passione al Dr. Di Vincenzo, Dirigente provinciale dell'Azienda Regionale Foreste Demaniali di Messina, all'Agente tecnico Saija, ai "ciccaioli" per la fase di pieno campo ed ai "segantini" per quella in segheria, al Sig. Romano, proprietario della segheria "la radica" di Antonimina (RC), ed infine ai due fratelli Demetrio, poco più che ventenni, proprietari della segheria "La radica" di Gioiosa Jonica (RC).

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## Rapporti fra comunità locali e amministrazione forestale. Il Cadore dopo le leggi napoleoniche

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### Abstract

This work is intended to face up the most important problems crop up at disagreement/agreement about new forest laws and about modern centralized government, that is set up by Napoleonic State with the forms and organisms of conventional management of the forests: and so also the conflict between dictates of dawning forest science and the knowledge and the popular beliefs, which have been strengthened and sharpened during centuries before. The specific reference is from the mountain area of Cadore, in the upper Veneto, where impact is stronger, also because the population, in this woody alpine sub region, enjoyed a large autonomy under Venice Republic: exercised through institutions of political-administrative organisations, which at the beginning of nineteen century were replaced with modern administrative state's structures. Enquiring into the deepest reasons of this contrast, the debited forms, the arguments set from one side to another, the results of trial strength between central government and local organisms, who will last for a long time when the area will be under the rule of Austria too: all these, are work's goals, it has been handled making use of different sources and first of all using state archives' documents of Milan for Napoleonic Age and using those of Venice archives for Habsburg Age.

In the Napoleonic Age, in Veneto as elsewhere, the modern state, introducing new organic forest legislation and a modern centralized administration, conflicts with forms and organisms of forest traditional management. It a matter of contest between the dawning forest science's dictates, which state asserts to be inspired by, and customs and popular beliefs strengthened and sharpened during centuries before in the bosom of local communities.

Impact is stronger in the mountain area of Veneto, particularly in Cadore, an alpine sub region that is overgrown with conifer forests. As matter of fact, here population had before, under Venice Republic, large autonomy, setting up political-administrative institutions. At the beginning of 19th century, modern administrative state structures sweep them away and brutishly replaced them.

In view of the existent situation, Napoleonic officers consider it nearly inspired by total anarchy. Shortly named prefect of Piave department (Cadore is part of it with Belluno and Feltre too), Carlo del Mayno writes to Minister of Interior to exemplify that area's economic conditions.

Recognizing forests as the main resource of population, he asserts it, paradoxically, «try to destroy with its own hands its wealth and the only means of sustenance [...]. You can see endless damages, endless usurpations, and endless inconsiderate and premature cutting private citizen and municipal administration's woodlands.

You can see eradicating a large spread out area, where plants take root by nature and they earn an assured profit; replacing with a field, mostly a sloping ground, which earth dragged away immediately after rains and thawing snows and this kind of cultivation makes often itself vain owing to inclement weather of seasons. You can see herds of goats are left helpless getting into forests, they climbing thick plants up tip away their bark, wilt them and often perish or they devour just grown tender buds. No discipline at the end, no regulation prescribe their care or facilitate their growth; and if

three districts' partial statues have established and have commissioned some useful measures, ex-Veneto government's weakness, licentiousness and abuse make effect useless».

If the deterioration mostly concerns areas in Pre-Alps district, Cadore forests are not immune. Anyway, lack of laws is general except for local statues regulations, as Republic passed the forest reform during its last years, aiming at Venetian Arsenal's interest, it has only concerned state forests and not municipal one; in mountain, it is nearly the totality.

Ready and qualified officer, del Mayno asks a regulation of entire forest field: not only severe measures to prevent forests' damages but also provisions useful to encourage their conservation and their growth through sylviculture interventions.

The legislation does not take time. Preceded by decree of 18th May and decree of 15th July 1808, the act of 27th may 1811 introduce unitary and regular forest legislation; it suggests severe rules, precise to give a structure to territory and it organically disciplined forest inspectorates. It establishes precise rules to give a structure to territory and to regulate felling in municipal forests too. It will come into force by Austria, for following fifty years of Habsburg domination too, few changes excepted.

First impact of new regulation is traumatic. In 1813 general management of State Property Office, issuing measures in accordance with law, decrees to put into effect borders' inspection, the preventive check of shipping agents choosing plants reserved to Navy, the trees' marking which should be felled by forest officers, the sale by auction of not felled plants, division in plots and regular cuts' sequence. Adding a preventive plants' estimate, put into effect by municipality staff and forest management in conjunction, it is necessary to estimate levy's cost to pay to Treasury, a tenth of sold timber's value.

Prescriptions are so and so many to put in danger forests' utilisation for years. Taking population's first means of sustenance away: some then, thought in a completely different environment, they are questionable and perhaps dangerous to Cadore forests' survival.

Here uneven-aged forest is handled by selection felling of plants have above settled diameter, so they are mature according an economic point of view. In a way every year more ten thousand trees felled in municipal forests, firs above all, reduced to commercial selections and sold during "May Fair" to Venetian timber dealers. They organised the trunks transfer by untied floating till sawmills along Piave banks, there, the trunks are shortened in planks, they, now tied, continue their trip, along the same river till Venice.

It is a complex method, for centuries tested, time limit's observance is a fundamental aspect, such as many other elements, new provisions are questioning. Against them, there is a unanimous disapproval. Many petitions have been presented to government body, populations threaten to riot and boycott the act: local authorities side with them, the prefect too, in some cases asking for application sending, in others, the complete abrogation of acts.

Problems are various and of different weight.

First of all preventive checks by forest and navy officers, just practicable after snow thawing and so not before the end of April, being a lack of officers, inspections will last so long to get impossible negotiate in time with dealers for river transportation; it can be only put into effect when river is in flood. It is necessary increasing involved staff realize these visits: the same thing for live trees estimate.

Secondly, selling still standing plants, local populations will starve because they will lose felling, setting up and deforesting works.

However, the most considerable regulation, the most opposed, is that order to replace plots felling with the selection one. It, meant as clear felling, is considered disastrous to forests, because it will imply almost all plants' cutting: both young plants, and so not saleable (the greater number), with big financial difficulties; and at present the mature plants, are partly kept to preserve the younger one from the winds and the snows. At a local level, there is no doubt: the result will be the total woods' destruction.

Finance Minister, Giuseppe Prina, driven by Minister of the Interior and general Police Director, which dread tumults and riots, pronounces himself the 18th of March 1813. He confirms some acts, such preventive plants marking, giving also provisions to speed it up. He makes in part way for other acts: only municipal officers will practise estimates; selling will be by auction, but after plants' cutting. Solving the most urgent question he compromises a solution, forcing act's interpretation which provides just the release of 20 growths for hectare: it establishes "felling will be done at plot, but it will fall only on mature plants".

The fall of Napoleon and political-institutional government's change does not solve problems and does not stop controversy. Habsburg government does not want to renounce forests' management and turn utilisation according to proper standards to preserve them from destruction and to get an income to Treasury: it safeguards Napoleonic legislation and it reorganizes forest management to give it a real accomplishment.

Arguments arise again in 1816 and particularly in 1817, when forest management takes a long time in cutting licence, threatening not to take part to "May Fair", in order to give a first accomplishment to concept of division in plots and drawing forest maps up: local organisms stage lively protest and Venetian government is afraid of a popular uprising; population in those years is so strongly by famine, government admits that claimants are completely right.

The existing documentation of the event gives us the opportunity to focus respective positions. Cadore residents claim their right to forests, considering as useless forms the cutting licences, they oppose to division in plots, weighing it up as an introduction to level cut; they refuse to pay tenth of felled plants' value. They attribute the delay to whims of forest officers. They confirm quality and efficacy of system they use, they think it is keeping forests for centuries while new acts threaten to destroy them, and they assert efficacy of traditional knowledge and habitual customs.

«There is certainly not forest officer, even if he has improved his knowledge, that mostly learns by Cadore woodsmen about cultivation, conservation and plants growth and skill and ability to do in a better way every forest operation».

The reply is sharp. Management, demanding division in plots (which affirm the not clear felling), is inspired by good forest economy's principles, «which, because they are just introduced in these provinces, necessarily get relevant difficulties in inveterate habits, in popular prejudices and in ridiculous application of erroneous and unbearable for common sense doctrines [...]. Cadore starts having shortage of forest cause cutting was regulated not by art and science but by inveterate habits made of popular prejudices».

State officers rebut the charge, and then they claim with pride and resolute defence of forest administration function, considered as the only able to guarantee woods' use that done according to scientific standards and not just according to experience and obsolete popular customs, they look them upon with contempt and scorn. They, specifically, thing necessary mountain communes follow the given rules for division in plots and regular sequence of cuttings.

Moreover, naturally they have to pay the tenth, considering it not as an arbitrary enforced tax but as an equivalent sum for forest officers activity, to guarantee forest protection and rational utilisation. A function that, it is repeated several times, forest administration's state body exercises for general interest: both of mountain populations which are assured a heritage conservation, otherwise it will be squandered; and plain populations, on which mountain deforestation's results will hit them, these consequences will be disastrous for the territory underneath.

These are two deeply different worlds which are facing and coming up against, inspired by opposed ideals and values: on the one hand modern state is interested to impose universal and uniform rules for general welfare and to apply them with a centralized and hierarchically organized administration. On the other mountain communities, try to oppose to state control in the name of tradition, trying to keep old margins of self-government, but also thinking that the rich store of technical knowledge, of empiric knowledge of territory, of practical experiences, for a long time tested, cannot be sacrificed by bureaucratic red tape. Sometimes, provisions show them completely wrong, other, they result unrealizable in different situations from the thought one; and then they impose long procedures which can be inefficient to follow nature expiry for cuttings and leave a lot of population unemployed and without income.

Communes will have to pay the tenth, then reduced to 8%, even if making outstanding deposits will last for decades. Communes should accept the control over felling plants and so marking from forest officers, which existence on territory will be habitual, instrument and symbol of state control.

On the other hand, forest officers will learn from experiences that in traditional skills not everything can be considered as the fruit of prejudice and ignorance. First, they will consider selection felling method, usually used in Cadore high forests, as the most suitable for environmental peculiarity of Southern Alps slope. They lively argue about clear felling that, according to German sylviculture principles, is used in South Tyrol woods, it is done with negative results, both financial side and territory safeguard.

Later, Adolfo di Bérenger, through sylvicultural reasons, will come the same conclusions. He will magnify "Cadore method" and will finally condemn clear felling "with unfortunately results" tried in Trentino: the eminent scholar and forest expert, fusing his huge scientific knowledge with a long experience of forest officer in Veneto woods, will point at uneven-aged forest and selection cutting (but according to a periodic shift and so dividing in plots) as examples to choose in other Italian areas too.

This system of forest management is still in Cadore during 19$^{th}$ century and state officers ascribe it, besides their control and protection activity, the conservation of forest wealth of that area: in fact they notice an improvement compared to the beginning of the century, it is evidence of diameter increase of felled trees. The support, given by officers to municipalities to get high prices from woods' sales, probably contributes to this result.

Tension and disagreement still exist between management and community, they often result in episodes of intolerance, accusation, denunciation and hard controversy.

However, there are also reasons, which lead them to form an alliance, under the incentive of a mutual interest, to oppose merchants' power, opposing their efforts to agree on the fall of prices during auctions. Higher selling prices mean larger incomes for communes, so they can reduce the pressure on forests, thank to them they obtain all their incomes, assuring in this way their better preservation. It assures state not only of a larger income but surer in time too.

# Forest science and local experience in the management of the woodland: The case of Extremadura's dehesa

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## Abstract

Since the middle of the 19th century, the German Forestry School's doctrines gained acceptance in Spain, spreading the idea that it was necessary to maintain some areas of communal and municipal property under State control. The official recognition of this assumption marked the beginning of a technical and economic planning process in the country which, considering neighbourhood practices as incompatible with conservation and production growth, attempted to remove the traditional models of exploitation in collective woodlands. The main objective of my work is to show the results of this process in Extremadura, an extensive region situated in the Southwest of Spain which has been historically characterized by the predominance of the Mediterranean ecosystem and by the preponderance of the open oak parkland (dehesa), a savannah-like landscape that can simultaneously offer livestock, forestry and agricultural production. The polyvalence of the dehesa system and the natural peculiarities of Mediterranean environment are essential to understand the special conditions in which the forest planning took place in the region. In such a process, the forest services attempted to apply the German principles, based on the luxuriant forests of Central Europe and the appreciation of wood and firewood. Given the particular features of dehesa, this intent had to be continuously reviewed to update it to local economic and ecological setting. At the end, the greatest success of the planning in Extremadura was just to give scientific support and statistical legitimacy, not to the forest intervention itself, but rather to the traditional potentiality of the dehesa system.

## 1. Introduction

From the middle of the 19th century, the liberal State in Spain carried out a double crusade against old collective rustic patrimony (communal and municipal property). On the one hand, by means of the Law of General Disentitlement of 1855, it put on sale most of the estates administered by local corporations, excepting from privatisation only communal lands in the strict sense (free and gratuitous use for a limited neighbourhood), pastures allocated to beasts of burden in each village and some communal and municipal forests with a specific environmental potentiality. All these farms continued to be assets of collective property, but in administrative practice they began to be considered as public woodlands.

On the other hand, following the conservationist suggestions of the German Forestry School (Heinrich Cotta), the Spanish State took on the management of all non-privatised estates, posting foresters in each province and putting them in charge of regularising the exploitation of the new public surfaces. The main control instrument in order to carry out this duty was the drawing up of forest exploitation plans (Pafs): detailed programmes of annual uses based on the local corporations' proposals and adapted by the provincial forest services to the Forestry Science's techniques (Manuel-Valdés & Sáez-Pombo 1989). This system, consistently developed in Spain between 1875 and 1925 as a previous step to the scientific forest planning in the strict sense of the expression, was

reinforced in 1876 through the deployment of a billeted police force ascribed to the army (guardia civil) that, from then on, supplemented the existing rural guards.

The underlying objectives of the intervention were not only to assure the conservation of the new public woodlands and to rationalise their production according to Forestry Science, but also to convert free and gratuitous practices into restricted and onerous ones by means of the implementation of the public auction as a main method for adjudication of the rights of use. Likewise, through technical and police intervention, the Spanish State attempted to impose, for the first time, the collection of taxes on the production of the new public surfaces in order to pay the costs of the forest administration itself (Jiménez-Blanco 1991).

The present work, derived from a careful examation of the annual exploitation plans and the forest production statistics, tries to show the ambiguous results of this first planning process in Spain by studying the case of Extremadura, an extensive region in the Southwest of the country. This region, administratively divided into two provinces since the 1830s (Badajoz and Cáceres), has been historically defined by the predominance of Mediterranean landscape and by the importance of the communal and municipal woodlands for the livelihood of the villages (Linares 2002). The great difference between Spanish Forestry Science, directly inherited from German doctrines (Gómez-Mendoza 1992), and the ecological and economic peculiarities of this kind of woodlands endorses the choice of Extremadura to test the suitability of scientific knowledge to the sustainability of the traditional forest management.

## 2. The dehesa's system in the middle of the 19th century

Although it is difficult to know exactly the area covered in Extremadura by the communal and municipal woodlands before the beginning of the planning process, some local and regional forest surveys of the middle of the 19th century allow to estimate a total surface of over a million hectares, divided among nearly 2,000 estates (Linares 2002). These properties were mostly large farms (between 300 and 600 hectares) in which trees and shrubs had been partially or almost totally eliminated in favour of extensive grazing areas. In other words, as the forest surveys themselves suggest, these collective woodlands were in fact 'dehesas'.

Dehesa is a savanna-like landscape characterized by pastures with scattered holm and cork oak stands and understoreys of grass, cereal and scrub (Plieninger 2003). It is also an agrosilvopastoral land-use system in which livestock raising is the activity that conditions the other uses (Campos 1984, Zapata 1986). The initial state of dehesa is the so-called 'monte pardo': transitional scrubland and woodland in which oaks are accompanied by woody species. Human intervention consists of gaining pasture and, in due time, arable land from densely populated areas. Through periodic pruning and felling, impenetrable forest begins to acquire a polyvalent and alternating use (Martín-Galindo 1966). The great advantage of the system in its traditional form is that it can simultaneously offer growing livestock, forestry and agricultural production without irreversibly endangering the Mediterranean ecosystem (Campos 1984; Dawson & Fry 1998; Plieninger & Wilbrand 2001).

According to the available information, this special flexibility was very present in the communal and municipal patrimony in the middle of the 19th century. Grasses and pastures were consumed by both beasts of burden and breeding livestock. From October to January, municipal authorities reserved the dehesas populated by holm oaks for pigs to feed on acorns shaken from the trees with rods. Subsequently, villagers pruned trees and bushes in order to assure the production of acorn for the next season and to stock up on firewood for the next winter. In scarce rainfall years, sheep and goats supplemented their diet with the tender branches of the trees.

In woodlands with cork oaks, every nine or ten years, the bark was stripped from the trees. The inner part of the bark served the local leather industry as a tanning agent. The outer part served for both domestic use as well as for the construction of beehives and, since the 1830s, for the bottle cork industry. In the areas most suited to cultivation, neighbours alternated sowing cereals with fallow periods of between 4 and 50 years. Once the crop was harvested, the fields were cleaned by local livestock, which could also graze the arable lands in fallow periods. Moreover, the communal and municipal dehesas represented a great resource in terms of wildlife to be hunted and fished, of mushrooms and medicinal plants to be gathered and of stone, sand and clay to be quarried (Linares 2001).

The periods and the duration of these practices were generally regulated by local ordinance and, thanks to the strength of custom, were perfectly understood by rural community. The existence of codes did not guarantee the absence of abuses, but, at least, legitimised neighbours' complaints against self-interested conducts. Nor did it assure the equitable distribution of the production of collective woodlands, but it did guarantee to some extent the survival of those customs which contributed most strongly to the peasantry's income: fodder for draught animals, sustenance for pigs, small plots for cultivation, construction materials, firewood and charcoal, fishing and hunting or gathering of mushrooms and medicinal plants.

Table 1. Privatisation of communal and municipal woodlands in Extremadura (1855-1925)
(Hectares and Percentages)

| | Privatised Surfaces (1855-1925) | | | | Percentages over Total | | |
|---|---|---|---|---|---|---|---|
| | 1855-1875 | 1875-1900 | 1900-1925 | 1855-1925 | 1855-1875 | 1875-1900 | 1900-1925 |
| | Ha | Ha | Ha | Ha | % | % | % |
| Badajoz Province | 310,559 | 71,829 | 9,158 | 391,546 | 79.3 | 18.4 | 2.3 |
| Cáceres Province | 482,760 | 42,314 | 5,170 | 530,244 | 91.0 | 8,0 | 1,0 |
| | | | | | | | |
| EXTREMADURA | 793,319 | 114,143 | 14,328 | 921,790 | 86,0 | 12,4 | 1,6 |

SOURCE: Linares (2002)

The Law of General Disentitlement of 1855 broke the existent balance in regard to social sharing. Despite protests against privatisation (Linares 2004), from 1855 to 1925 almost a million of hectares of collective forest were transferred in Extremadura into private hands (Table 1). Even though these transactions had important consequences for the use of the non-privatised woodlands, the aim of the present work is not to study the privatisation process, but the effects of the planning implemented from around 1875 in the holdings which were not transferred into private hands. In this sense, the available evidences seem to show that, rather than breaking the traditional flexibility of the dehesa, the forest intervention in the region gave scientific legitimacy to the customary polyvalence of this system.

## 3. The forest planning process in Extremadura (1875-1925)

There are two sources to know the evolution of the forest planning process in Spain as a whole. The first one is manuscript documentation that provincial forest services generated between 1875 and 1925, mainly the information collected in the annual exploitation plans. These projects, scarcely

employed until now (Manuel-Valdés 1996, Sáez-Pombo 2000), are currently distributed among the Agriculture Ministry Archive (AMA) and the Administration General Archive (AGA). The second one consists of annual production statistics which were published by Spanish Forestry Administration between 1861 and 1880 and from 1901 to 1933. Although the special characteristics of these statistics (GEHR 1991) hinder the contrast between forecast production and actual one in a serial way, the jointly exam of exploitation plans and published statistics allows to check the general result of the planning process.

As for the management, the sources available for Extremadura show the difficulty to finish off the traditional running models. The production statistics reveal, for instance, that the aim of reducing the communal practices was far to be an accomplished objective. Despite an advance on the auctions between 1875 and 1925, neighbourhood uses continued to be relatively important at the end of the period (Table 2). This fact is related to the increase of the products extracted from the non-privatised woodlands. Spanish forest authorities note such a possibility when, in the production statistics of 1871-1875, expose that over the last few years the grazing for beasts of burden, "particularly in the provinces of Extremadura, are the object of different uses, in addition to pastures, that considerably increase their productivity" (Dirección General de Agricultura 1866-1887).

Table 2. Uses realized in Extremadura's village woodlands (1875-1925)
(Thousands of Pesetas of 1913 and Percentages)

| Adjudication Forms | Badajoz Province | | Cáceres Province | | Extremadura | |
|---|---|---|---|---|---|---|
| | 1875-1877 | 1923-1925 | 1875-1877 | 1923-1925 | 1875-1877 | 1923-1925 |
| Annual Average Value | | | | | | |
| Auctioned Uses | 25 | 103 | 286 | 497 | 311 | 600 |
| Neighbourhood Uses | 652 | 80 | 320 | 393 | 972 | 473 |
| (*) Extraordinary Uses | 11 | 0 | 7 | 5 | 18 | 5 |
| Total Uses | 687 | 183 | 613 | 895 | 1,301 | 1,078 |
| Percentages | | | | | | |
| Auctioned Uses | 4 | 56 | 47 | 55 | 24 | 56 |
| Neighbourhood Uses | 95 | 44 | 52 | 44 | 75 | 44 |
| (*) Extraordinary Uses | 1 | 0 | 1 | 1 | 1 | 0 |
| Total Uses | 100 | 100 | 100 | 100 | 100 | 100 |

(*) They involve fraudulent uses and destroyed products which were appraised for statistical purpose.

SOURCES: Dirección General de Agricultura (1866-1887); Dirección General de Agricultura (1925-1927). Original data have been deflated through price series collected in Ojeda (1988).

From this point of view, privatisation can be considered as a spur for the rupture of the customary but tense equilibrium between rural community and natural resources. Indeed, contrary to those authors who consider common systems as incompatible with sustainability (Hardin 1968), for some critics it is precisely the redefinition of collective property rights which causes the main problems in many ecosystems. This idea, which is grouped around the thesis of the 'tragedy of enclosures' (Sala 1996), sustains that privatisation or nationalisation, rather than guaranteeing the conservation of assets, can lead indirectly to the 'tragedy of the commons' from the moment it induces forcible violation of traditional norms of management and natural resources renewal.

In terms of productive guidance, the forest planning process in Extremadura also left a lot to be desired. Observing the evolution of monetary value collected in the exploitation plans between 1875

and 1925 (Table 3), the only noteworthy change in the 'day-book' of the forestry experts posted in the region was the growing role acquired by pastures and crops on detriment of corks and acorns. This change was not the result of indiscriminate felling in communal and municipal dehesas. According to provincial forest services, the most important causes of corks and acorns' decline were, on the one hand, the sale of trees authorized by the State during the last decades of the 19th century and, on the other hand, the disasters produced in holm oaks during the 1890s by a plague of Malacasoma Nestrium. In view of such eventualities, what the forest exploitation plans seem to show in Extremadura is the growing approach of the scientific principles to the regional productive horizon.

Table 3. Forecasted production in Extremadura's village woodlands (1875-1925)
(Thousands of Pesetas of 1913 and Percentages)

| Three Years | Pastures | Acorns | Crops | Woods | Corks | Others | Total |
|---|---|---|---|---|---|---|---|
| Annual Average Value | | | | | | | |
| 1875-1877 | 655 | 342 | 65 | 14 | 44 | 0 | 1,120 |
| 1881-1883 | 1,148 | 382 | 175 | 41 | 38 | 0 | 1,785 |
| 1887-1889 | 1,313 | 145 | 77 | 27 | 62 | 1 | 1,625 |
| 1893-1895 | 1,214 | 88 | 85 | 36 | 53 | 1 | 1,478 |
| 1899-1901 | 885 | 54 | 103 | 27 | 11 | 1 | 1,081 |
| 1905-1907 | 858 | 50 | 95 | 30 | 7 | 2 | 1,042 |
| 1911-1913 | 976 | 53 | 98 | 38 | 17 | 4 | 1,187 |
| 1917-1919 | 584 | 28 | 39 | 28 | 5 | 6 | 691 |
| 1923-1925 | 885 | 33 | 95 | 19 | 4 | 4 | 1,040 |
| Percentages | | | | | | | |
| 1875-1877 | 58 | 31 | 6 | 1 | 4 | 0 | 100 |
| 1881-1883 | 64 | 21 | 10 | 2 | 2 | 0 | 100 |
| 1887-1889 | 81 | 9 | 5 | 2 | 4 | 0 | 100 |
| 1893-1895 | 82 | 6 | 6 | 2 | 4 | 0 | 100 |
| 1899-1901 | 82 | 5 | 10 | 3 | 1 | 0 | 100 |
| 1905-1907 | 82 | 5 | 9 | 3 | 1 | 0 | 100 |
| 1911-1913 | 82 | 4 | 8 | 3 | 1 | 0 | 100 |
| 1917-1919 | 85 | 4 | 6 | 4 | 1 | 1 | 100 |
| 1923-1925 | 85 | 3 | 9 | 2 | 0 | 0 | 100 |

SOURCES: AMA, Pafs, Badajoz and Cáceres (1875-1913); AGA, Pafs, Badajoz and Cáceres (1914-1925). Original data have been deflated through price series collected in Ojeda (1988).

This approach was related to the transformation experienced by the Spanish Forestry School since the beginning of the 20th century. From then on, a new forest economy, based on the recognition of Mediterranean landscape's traditional resources, was developed in the country (Gómez-Mendoza 1992, Manuel-Valdés 1996). But the progressive abandon of the German doctrines was not the outcome of a mere intellectual adjustment. Behind the change it is impossible not to see the remarkable role played by the different social and economic interests which, since the beginning of the planning process, had to face the forestry experts stationed in each province. These interests and the impediments they generated at local and provincial scale were just what, little by little, undermined the original spirit of the forest engineers to end up stimulating the great leap forward of the Spanish Forestry School.

In Extremadura, one of the most important obstacles to the provincial forest services' task was the concealment of woodlands which officially might be submitted to the planning process. Until the last years of the 19th century, the exploitation plans of the region did not stop to register important

increases in the number of estates under control. Most of these, deliberately hidden by municipalities, were safe from any statistical entry in the capacity of 'not investigated woodlands'. If it was very difficult to control the exploitation of the already identified farms, the planning scheme in the not investigated ones was practically inexistent.

In the known holdings, the most frequent tactic employed by local corporations to avoid the forestry experts' supervision was not to send them their annual proposal of uses as stipulated by the forest legislation. This practice was the main reason offered by the engineers posted in Extremadura to explain the difference between forecasted and real woodland production, a difference which was specially significant at least until the beginning of the 20th century (Table 4). Given the vast extension of the region, the refusal to send exploitation proposals left the forest services in the region without the information needed to check the course of their own planning process.

Another form of resistance was the negation of the villagers to pay the taxes imposed by the central administration on the use of non-privatised woodlands. Only in the last years of the 19th century the payment of taxes became more regular, although it is not clear whether this greater regularity was due to improved enforcement methods or because neighbours began to view the payment as a guarantee to exclude unauthorised users. This latter is probably the reason that can explain the relative regularisation of the public auctions in the use of the pastures since the first decade of the 20th century. Until then, the previously agreed absence of bidders at the annual auctions was another method to elude the planning process.

When auctions began to gain certain level of acceptance, it rarely guaranteed the submission to the technical conditions established by the provincial forest services. Villagers consistently introduced more than had been agreed at the time of auction. This resistance against the Forestry Science's doctrines was, however, progressively accepted by engineers posted in Extremadura. So much so that the forest annual plans drawn up for the first quarter of the past century, instead of reducing the livestock density, maintained it constant in the estates submitted to planning. All of this from the conviction that, in spite of scientific principles, "grazing is now and will continue to be for many years the use that will provide the major incomes to municipalities and to the State" (AGA, Pafs, Cáceres 1916-1917).

Adaptation to dehesa system was especially controversial in the case of goats. From the first years of the planning process, these animals were considered as declared enemies of a sustainable forest management. In fact, the presence of goats in the plans of Extremadura was continuously denounced by the country's forestry authorities. Engineers of the region justified the decision claiming that it was a way to avoid "the numerous denounces received in provincial services because of abusive grazing of goats in forests adjacent to particular ones" (AGA, Pafs, Cáceres 1894-1895). In other words, once confirmed the fraudulent presence of this kind of livestock in the farms under planning, it was convenient to yield to pressures of the villages rather than breeding, via prohibition, the complete devastation of populated areas.

Something similar happened with the ploughings. The planning process not only did not achieve to restrict these practices in communal and municipal dehesas, but also, to some extent, acted as an official guarantor of them against the forestry authorities' disapproval. In the first contacts with regional reality, provincial engineers, before technically justifying the crops, recognized the power of custom (AGA, Pafs, Badajoz 1873-1874). As time went on, foresters ended up by accepting the ploughings as practices intended for improving the tree production in the new public woodlands (AGA, Pafs, Badajoz 1880-1881). It was another form to adapt the principles of Forestry Science to the empirical evidence and, above all, another via to achieve a minimum of acceptance among rural communities.

Analogous change of attitude can be observed with regard to wood and firewood. Beyond dehesa's forestry potentiality, limited by nature, the principal preoccupation of the foresters on this respect was the little monetary remuneration that such products acquired in the market. In this sense, the forestry experts posted in the region shortly realized that, besides collective practices' power, the habits traditionally developed in private woodlands were an important obstacle not easily surmounted. If, on one hand, the Extremaduran timbers were accustomed to extract wood in particular forests without taking into account any facultative prescription (AGA, Pafs, Cáceres 1891-1892), on the other hand, the landowners used to gratuitously give the firewood of their farms with the aim to favour the growth of acorns (AGA, Pafs, Badajoz 1912-1913). In view of these practices, the forest engineers finally admitted the impossibility of regularising the daily exploitation of wood and firewood.

Table 4. Forecasted and real production of Extremadura's village woodlands (1875-1925)
(Thousands of Pesetas of 1913 and Percentages)

| Three Years | Pastures | Acorns | Ploughings | Woods | Corks | Others | Total |
|---|---|---|---|---|---|---|---|
| 1885-1877 | | | | | | | |
| Forecasted Production | | | | | | | |
| Annual Average Value | 655 | 342 | 65 | 14 | 44 | 0 | 1,120 |
| % | 58 | 31 | 6 | 1 | 4 | 0 | 100 |
| (*) Real Production | | | | | | | |
| Annual Average Value | | | | | | | 1,283 |
| 1894-1896 | | | | | | | |
| Forecasted Production | | | | | | | |
| Annual Average Value | 1,226 | 73 | 79 | 41 | 39 | 1 | 1,459 |
| % | 84 | 5 | 5 | 3 | 3 | 0 | 100 |
| Real Production | | | | | | | |
| Annual Average Value | 1,167 | 39 | 40 | 9 | 1 | 0 | 1,256 |
| % | 93 | 3 | 3 | 1 | 0 | 0 | 100 |
| 1923-1925 | | | | | | | |
| Forecasted Production | | | | | | | |
| Annual Average Value | 885 | 33 | 95 | 19 | 4 | 4 | 1,040 |
| % | 85 | 3 | 9 | 2 | 0 | 0 | 100 |
| Real Production | | | | | | | |
| Annual Average Value | 884 | 21 | 124 | 39 | 2 | 3 | 1,073 |
| % | 82 | 2 | 12 | 4 | 0 | 0 | 100 |

(*) Statistics do not involve specific data about each use.

SOURCES: AMA, Pafs, Badajoz and Cáceres (1875-1878 and 1894-1896); Dirección General de Agricultura (1866-1887); Dirección General de Agricultura (1925-1927). Original data have been deflated through price series collected in Ojeda (1988).

With reference to other uses, the planning could not avoid the strength of reality either. In the case of tender branches, charcoal, stone, clay, brushwood, beehive or catch, the personnel charged with technical supervision proceeded as simple agents of the requirements expressed by the villages in the few exploitation projects that local corporations sent to the provincial forest services. The main aim of these requests was to increase the incomes of the municipal budget auctioning products reassessed by the market. In the concrete case of the game, the forestry experts attempted to impose

a regular system of public auction but they ended up by accepting the local custom: it had always been free for neighbours and continued to be so after the arrival of the forestry experts (AGA: Pafs, Cáceres 1898-1899).

The recognition exemplifies again the need of adaptation. Faced with the difficulty of abolishing certain local practices, forest provincial agencies had no option but to admit them in order to gain a minimal acceptance among the villages and to avoid indiscriminate attacks as revenge to prohibitions. In this sense, it must be taken into account that the fraudulent uses were very present in the Spanish forestry experts' agenda (GEHR 1999). In Extremadura, non-forecasted cutting, abusive grazing, unlawful ploughings or massive thefts of acorns filled the forest annual reports with a lot of references. Only from the first decade of the 20th century these infractions started to go down. In fact, the progressive reduction of fraudulent uses was really what allowed fitting the real magnitude of the communal and municipal woodland production with the value registered in statistical data. And this suitability was only possible by means of the official acceptance of practices initially considered as criminal ones, such as the entry of goats or the crops in non-privatised woodlands.

In the process of adaptation to local experience, only the German principles were put into question. The Spanish State, sponsor of the planning, likely benefited from it. Not in vain, the adjustment between the real production and statistical one was preceded by the consolidation of the tax payment and the decrease of communal uses. In both cases, the result was an increase of public incomes. To the foresters posted in Extremadura, the statistics finished up by making them right. For that, of course, they had to adapt the scientific knowledge to regional surroundings. At the end, however, forest engineers certainly achieved to regularise, if not the course of the production, at least the statistical control of the traditional uses.

In this sense, the contrast between the exploitation plans and the production statistics for the first years of the 1920s is really enlightening (Table 4). If agropastoral is the kind of woodland forecasted by the provincial forest services, agropastoral is, too, the type of forest collected in the published production statistics. From this perspective, it is possible to conclude by saying that the greatest success of the forest planning process in Extremadura between 1875 and 1925 was just to give statistical legitimacy, not to the State intervention itself, but rather to the physical and economic attitude of the intervened environment. More exactly, the forest planning in the region statistically supported the productive polyvalence of the dehesa system.

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## History and Refinement of TFK: An Asian Perspective

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### Abstract

Forests in the Asian context is part of a cultural landscape linked to livelihood concerns of traditional societies (those living close to nature and natural resources). In the present day context, where forest resources are rapidly being degraded in the Asian tropics, sustainable forestry implies economic benefits (timber and non-timber forest products – NTFPs) accruing to all the stakeholders, with emphasis on community participation, particularly in the Asian context, where livelihood concerns of traditional forest dwellers is a key issue. In this context, there is an increasing realization today that we need to move beyond formal knowledge based sylvicultural issues, and find appropriate linkages with well researched traditional forest knowledge (TFK) available with local communities, so that community involvement could be ensured based on a value system that they understand, as discussed here.

### 1. Introduction

Forests in the Asian context is part of a cultural landscape linked to livelihood concerns of forest dwellers (Ramakrishnan, 2001; Ramakrishnan et al., 2005). Therefore, it is not surprising that conflicting situations often arise where the forest biodiversity linked economic benefits that local communities are seeking often clash with the traditional foresters' emphasis on managing the forest for timber. Further, conservation of biodiversity becoming a key issue, forest managers often try to keep the humans out the protected forest landscape. With a substantial section of the humans being directly dependant upon forest (for timber and non-timber forest products), and forests contributing towards sustainability of their traditional agricultural systems (Ramakrishnan, 2001), involving local communities on the basis of the value system/s that they understand and appreciate is seen as the key for sustainable forest management. It is in this context, Traditional Forest Knowledge (TFK) generated by traditional societies through an experiential process and précised over time and space becomes critical for ensuring community participation for sustainable forestry in the developing Asian tropics.

### 2. Historical evolution of TFK in the developing tropics

Moving from the hunter-gathering stage, incipient management of forests has been the first step towards domestication of the forested landscape by many traditional societies – what is referred to as 'domiculture' (aggregation of economically important species from the surrounding forest) that attempts to concentrate biodiversity of economic value as part of forest management (Hynes and Chase, 1982). From here, it is not difficult to see the next step towards better organized forest based agriculture and animal husbandry . Thus, the hunter-gatherer Kayapos of Aamzonia, moving on trekking group expeditions ranging from a few weeks to several months are said to have nomadic agriculture as 'trail-side plantings' (Posey, 1985, 1993).

From here, the evolution of, what we still have now fairly widespread in the forested landscapes of the tropics, namely, shifting agriculture, variously termed as 'swidden', slash and burn agriculture,

is not difficult to see. The 'taungya' (the Burmese word for shifting cultivation) system of forest plantation management of Shorea robusta introduced by the British foresters during 1870s, therefore, was seen at that time as an alternate to shifting agriculture practiced by the forest dwellers. During the early phase of the plantations, a number of crop species rice, maize, millets, a number of vegetables and cash crops such tobacco and castor plants could be brought in, before the tree canopy limits light penetration to the ground level. Emphasizing being more on forestry that is the primary concern of the forester rather than agriculture per se, it is not difficult to see that the forest farmers lost interest soon in the 'taungya' system itself, and therefore such a management system could not take off. The emerging message is that greater emphasis has to be placed on people's concerns, and the linked TFK towards a more integrated forest landscape management; on hind sight what we see now is that neither foresters nor conventional agricultural scientists have been able to take such an integrative view towards a redeveloped shifting agriculture that is based upon sustainability concerns.

In recent years, there has been an increasing interest in forest-linked traditional agricultural systems such as shifting agriculture itself (Ramakrishnan, 1992a; Ramakrishnan et al., 2006), a whole range of traditional agricultural typologies that exist in the forested landscape, moving along an intensity of management gradient (Fig. 1) – causally managed, management at low, medium intensities all within the forested landscape, leading to 'modernism' at high intensity management, the last being delinked from the forested landscape (Swift et al., 1996). This implies that when dealing with TFK, it is often difficult to segregate natural forest ecosystems from human-managed traditional agricultural systems, an issue that is often overlooked when dealing with sustainable forestry.

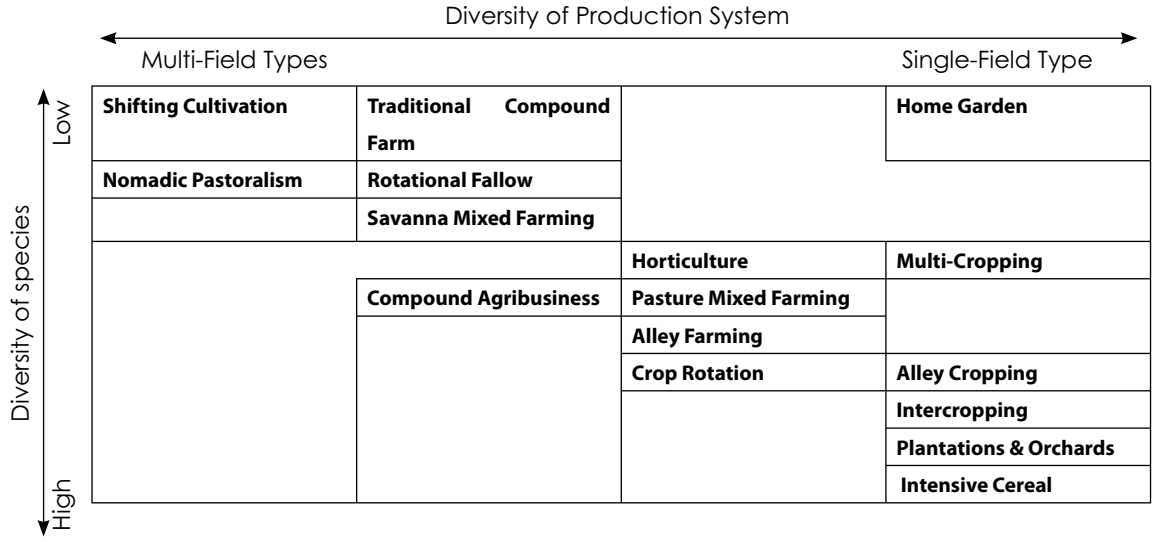


Figure 1. Broad agro-ecosystem typologies linked to species richness (x-axis) and agro-ecosystem complexity (From: Swift and Ingram, 1996)

With over 80 per cent plant species in well maintained forest being of NTFP value (National Academy of Sciences, 1975; Berlin, 1992; Hladik et al., 1993; Parrotta, 2001), and many thriving under natural conditions alone and not amenable for domestication, sustainable NTFP management and harvest is now being viewed as a route to follow for sustainable management of timber resources and conservation of forest biodiversity itself, with the involvement of all stakeholders (Peters, 1994). Collecting baseline data through forest inventories, monitoring of the resource through periodic surveys done on regeneration of the resource and harvest adjustments are seen to be options available for designing strategies for sustainable use of a given NTFP item; the challenge before us

is about converting the theoretical considerations into practical applications in field situations (Ramakrishnan, 2001). It is in this context, we need to look at implications of TFK on sustainability concerns, in the context of the existing social/cultural taboos and seasonal restrictions imposed by many traditional societies on NTFP extraction from the wild (Ramakrishnan et al., 2005).

In all these efforts studies should concentrate upon evaluating TFK in a given socio-ecological system context, emphasizing upon that is relevant for taking ecosystem/landscape level management decisions and regional planning, cutting across soico-ecological systems (Ramakrishnan, 2001; Ramakrishnan et al., 2005).

## 3. Knowledge systems

Sylvicultural knowledge and that deals with ecosystem structure and functions have been the basis for decision-making in forestry practices. Equally important, particularly in the context of the developing tropics is the rich traditional ecological knowledge (TEK) that modulate ecosystem/landscape level processes, a knowledge system that is integrative in nature, touching upon ecological, social, economic, and cultural dimensions (Ramakrishnan, 1992b).

### 3.1 Formal knowledge

'Formal' knowledge derived through an 'hypothetico-deductive process arising from a biophysical understanding of ecosystem landscape processes has been well studied and elaborated (Odum 1971), though this knowledge that deals with biophysical attributes of ecosystems tends to be largely independent of the locally relevant human dimensions of the problem. Community perceptions and involvement tends to remain largely ignored.

### 3.2 Traditional knowledge

Arising from this inadequacy linked with local community participation in the decision-making process on natural resource management issues, the need to take societal perceptions on board has been felt in recent times (Ramakrishnan 2001; Berkes et al. 2003), and indeed, the need to link it with formal knowledge based functioning of ecosystems/landscapes (Ramakrishnan 1992a). Traditional societies derive both tangible and intangible benefits from natural resources around them (Ramakrishnan et. al. 1998). Often what may seem to be intangible tend to have a tangible implications for the societiey. Therefore, TEK that is obtained through an experiential process needs to be analyzed and integrated with the 'formal' knowledge to arrive at community participatory solutions to ecosystem/landscape management that is linked with sustainable development of local communities.

The benefits accruing from this traditional knowledge based belief system are of three kinds: (i) Economic – traditional crop varieties and lesser known plants and animals of food value, medicinal plants, etc. harvested from the wild; (ii) Ecological/Social – manipulation of biodiversity, at varied scalar dimensions – ecologically at sub-specific, species ecosystem and landscape levels; socially impinging upon decision-making process at the individual, family, village and ethnic group levels; (iii) Ethical – cultural, spiritual and religious belief systems centred around the concept of the sacred species, sacred groves and sacred landscapes, linking the intangibles with tangible benefits (Ramakrishnan, 2001; Ramakrishnan et al., 1998).

Intangibles operating at the cultural/spiritual level often can be seen to have direct economic value such as in the case of socially valued medicinal plants. However, what may seem intangible

often tend to have tangible benefits, operating at varied scalar dimensions – species, ecosystems and landscapes, often modulating soil-water regimes and hydrology, soil fertility and nutrient cycling, etc. This has implications for natural management, an area of research initiated by this author way back in the early 1970s, and now widely recognized as relevant to natural and human-managed ecosystem rehabilitation and management (Ramakrishnan 1992a). Often, intangibles (psychological/ethical/spiritual/cultural) may be important for ecological conservation (Ramakrishnan, 2003) – e.g., the role of socio-culturally valued species, ecosystems (sacred groves) and landscapes (sacred/cultural landscapes).

## 4. Linking conservation with sustainable forest management

Conservation linked with sustainable forestry demands, viewing forest ecosystem as part of an integrated socio-ecological system. The linkages between the ecological and the social boxes are to be established through TEK operating at varied scalar dimensions: plot to landscape levels in the ecological context, and individual level to village/cluster of villages level decision-making process in the social context (Fig. 2), as we did whilst working with the shifting agriculture in north-east India, an illustrative example for implementation in the Asian context.

### 4.1 The shifting agricultural landscape in north-east India

Shifting agriculture is a major land use system, along with a few others such as wet valley rice cultivation and home gardens (Ramakrishnan, 1992a). Being dependant upon subsistence farming, the emphasis is on traditional multi-species complex agroecosystems at low– or middle-intensity management, in which crop and associated biodiversity play a key role in the determining the ability of the multi-species agroecosystems to cope up with environmental uncertainties. Efforts by agricultural scientists to introduce alternate land use practices replacing shifting agriculture, based on text-book knowledge, have failed to take off over the last over 100 years.

The problem with shifting agriculture is arising from the fact that this agroforestry system, with its tree component spread across time (the forest fallow phase being de-linked from the cropping phase) and space (some selected tree species tend to be conserved even during the cropping phase too, such trees being not slashed and/or burnt) has gone weak, arising from the shortened fallow cycle of 5 years or even less. Arising from this, the obvious choice is to strengthen the tree component of this unique agroforestry model. The moot question is, what could be the basis for the choice of the tree species for this agroforestry based developmental model?

Arising from our studies on shifting agriculture (Ramakrishnan, 1992a) and from related studies on conserving the 'sacred' (Ramakrishnan et al., 1998), we realized that what is socially valued by local communities, invariably has ecological keystone value too. This then was seen as the connecting link for introduction of tree species in the already weakened fallows, largely devoid of tree species, under shorted fallow cycles. Since socially valued species links people with a value system that they understand and appreciate, and since such species mostly are ecological keystone species too, this cultural-ecological linkage was seen as the basis for a community participatory redeveloped model.

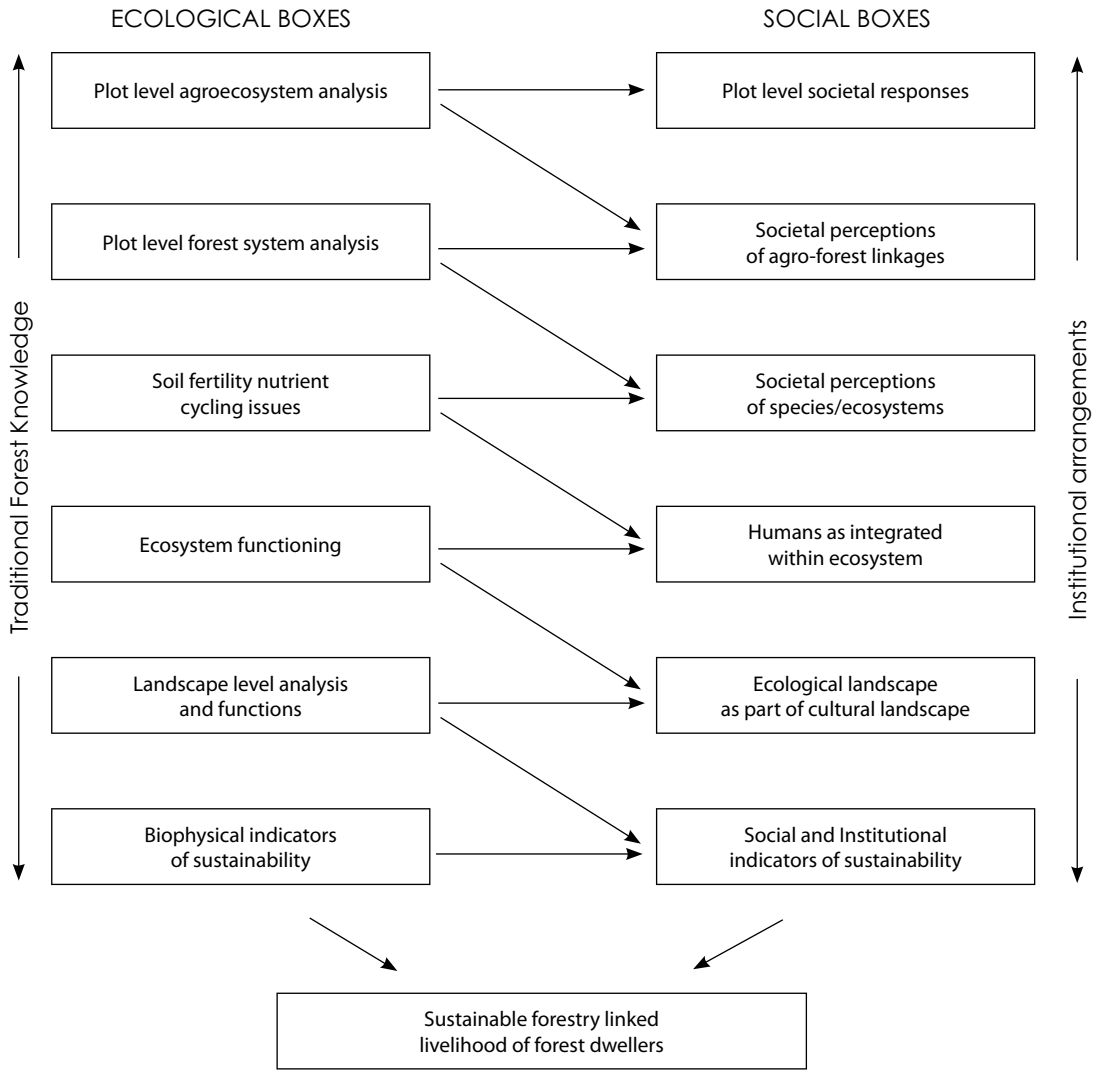


Figure 2. An iterative process for building linkages between ecological and social processes through traditional forest knowledge, at varied scalar dimensions. Appropriate institutional arrangements acts as a trigger for community participation.

Thus, in the early successional forest fallow forests arising from shifting agriculture (locally called jhum) of north-eastern hills of India, a socially valued species like Nepalese alder (Alnus nepalensis) is a significant keystone species, fixing up to 125 kg ha-1 yr-1 N, and therefore could improve crop yield substantially, under shorter shifting agricultural cycles, and thus contributing to system sustainability. Many bamboo species of the early successional fallows like Dendrocalamus hamiltoni, Neohozua dulloa, Bambusa tulda, and B. khasiana also fall in the same category, having the ability to conserve nitrogen, phosphorus and/or potassium (Ramakrishnan 1992a). What was realized early on during such an effort was that the chosen tree species have to be fast-growing, so that their harvest is synchronized with a short shifting agricultural cycle of 5-7 years. Such an inter-phasing of the ecological and the social was achieved using TEK as the connecting link; such an approach formed the basis for a major shifting agriculture redevelopment initiative based on forest fallow management, in north-eastern hill region.

Since it is often difficult to ascertain the ecological keystone value of all selected tree species except through a time consuming research analysis, the short-cut approach was a participatory species selection process, the underlying principle being that what is socially valued invariably will have eco-

logical keystone value too, as shown by us in another study on conserving the sacred (Ramakrishnan et al., 1998). Such a participatory process was made possible through Village Development Boards (VDBs) that took into consideration the traditional ways in which village-level institutions are created; in other words, over 35 different ethnic groups present in Nagaland, where this shifting agriculture development initiative was taken up, were allowed to have institutional arrangement based upon their traditions, but all having participatory land use development functions.

Involving over 1200 villages that Nagaland has, and with over 200 test plots and many more replicates, all undertaken through VDBs (NEPED and IIRR 1999), community participation for sustainable management of soil fertility through the selected tree species for fallow management was put in place; strengthening the agroforestry system allowed for value-added crop diversification, at the same time providing cash income through harvested timber (Ramakrishnan 2001; Ramakrishnan et al., 2006).

In this north-eastern Indian initiative, objectives were many-fold: (i) redeveloped shifting agriculture based on agroforestry principles of fallow management; (ii) conservation and sustainable management of natural and human-managed biodiversity; (iii) carbon sequestration to mitigate 'global change'; and (iii) redeveloped 'cultural landscape' based on societal value systems

## 5. The way forward

Knowledge systems in general and TFK in particular, operating at the socio-ecological process level is an effective tool for generating 'hybrid technologies' that enable us to link management/conservation measures with societal concerns, in the context of rapidly dwindling forest resources of the developing tropics, through a participatory mode. In order to integrate TFK with sylviculture based largely forestry practiced now, 'reach-out' initiatives to all stakeholders are important. The need is to create a critical mass of interdisciplinary scientists through education at all levels, sensitize policy planners and developmental agencies, carry the message to public at large, in order to take this initiative on TFK, forward; we ha e done this during the last few decades through the spoken and written media (Ramakrishnan, 2001; Ramakrishnan et al., 2005) and even through conversion of well worked out research results into audio-visual documentaries, to cite here only two examples (Rego, 2004; Reba, 2005) out of many other efforts. The key message is that, for effective community participation, a flexible adaptive management plan that is evolving all the time through discussions amongst all the stakeholders is the key for effective use of the knowledge systems in addressing forestry linked sustainable developmental concerns of the relevant human societies.

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# Selection forestry between tradition and innovation: five centuries of practice in France

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## Abstract

Among French foresters, single stem selection or group selection now seems to be at the base of the most up-to-date management systems in the mountains. Besides providing low windthrow hazard, this approach is supposed to achieve maximum non-market benefits: soil protection, fauna and flora conservation, water resources protection… Landscape concerns also tend to popularize the idea of a continuous-cover forestry. Numerous experiments are carried out, in the manner of those established by the NGO Pro Silva, in association with private and public forestry structures. This fresh attention is focussed on well-considered, highly rational modern techniques, but in certain ways, it can be considered as a return to a centuries-old tradition. Selection management systems were commonly used in European mountains as a way to make the most of fragile forests without endangering them. This raises questions about the nature of traditional forestry practices, and their relations with modern management systems: what were pre-1800 practices? Were selection cuttings used as a routine method because they were the easiest to organize, or were they a rational choice? How did they come to be partly abandoned in the 19th Century, and why did they survive in certain regions, like the Jura which can be considered as a conservatory of traditional selection management?

## 1. Introduction

Many traditions once deemed archaic are today enjoying a strong revival, thus showing the importance of the conservation of traditional lore. Traditional management systems belong to those centuries-old knowledges which should be considered as an inestimable value for humanity. In our present time, irregular forestry and, more specifically, selection forestry are very often considered as the most up-to-date management systems; they are supposed to be the most able to meet with the modern standards of a sustainable forestry, including non-market benefits. Indeed, some even consider that selection forestry and close-to-nature forestry are quite synonymous, which is not always true, as George Peterken has shown (Peterken 1996).

Of course, selection forestry is a modern, science-based management system, based on decades of both practice and scientific experiments. But it also has a centuries-long history, and belongs to our traditional management systems in Europe, especially in the mountainous areas of the Continent (Schütz 2001). This paper aims to define the links between ancestral and modern practices.

## 2. Traditional selection forestry: archaic custom or rational management?

### 2.1. Resources

But what do we know about selection forestry before 1820, and how do we know it ? Fortunately, woodlands were such an important resource in that time, that they had to be carefully managed, and of course this care led to many writing, and lots of archives available for historians. Some

documents are poorly interesting, such as most of ancient maps; many were lost; others were carefully preserved through centuries and bring immense amounts of information.

Environmental history historians may in particular be interested in particular registers called registres de martelages, in which foresters had to record all markings of trees (martelages), day after day and tree by tree. They were held by royal foresters of Central France from the 16th Century on, and much later elsewhere. These documents are not available averywhere in France and, whenever they do exist, they may have been left aside by historians wary of their difficult and laborious use. To this day, very few experts have tried to explore this considerable bulk of archives. In 1984, the historian Andrée Corvol issued an exciting and much praised pioneer study in Burgundy ; registres de martelages thus proved to be a very promising source for historians (Corvol 1984). However, in more recent periods, few significant specialized works have been carried out on that matter (Rochel, 2004). As a consequence, forest history and forest management history are well advanced in some regions of France, as in the Paris area, the Jura, Vosges and Pyrenees mountains, but much less in other places, such as the Alps.

As regards the Vosges and Jura mountains, from the Middle Ages on, these two mountain massifs were used as a timber reserve for neighbouring regions. Large quantities of fuelwood and hundreds of timber rafts were floated down the rivers to adjacent areas and sometimes much further, to the Mediterranean ports and arsenals, or to Germany, Holland, Paris. This trade involved an important population of raftsmen, sawmill workers, woodcutters. It also meant, for forest owners and the most prominent wood merchants, large sums of money and the traffic was contested between different towns, families and local clans. This activity did bring attention to the importance of a conscientious forest management; forestry registers of that time appear to be highly detailed.

We have intended to use these registers with the methods of historical geography, focusing on spatial and temporal frameworks. Most of our data originate from an almost continuous series of such registers, held by the high foresters of the Duke of Lorraine and the King of France in the city of Saint-Dié, between 1748 and 1791. Our data gathered from available registres de martelages is composed of 1859 felling areas in coppice-with-standards, 308170 trees felled in coppice-with-standards and 190605 trees felled as selection cuttings.

Using these and other documents dating back to the 16th Century at best, and also taking into account previous works carried out on the history of French forestry, we can trace back the origins of modern selection forestry.

## 2.2. A real forest management?

Archives may be explored in order to understand pre-19th century management, but did the foresters of that time really manage their forests?

According to many authors, fortunately getting fewer and fewer, there was no real management, only an informal selection of the best and bigger trees with no regard to regeneration or future growth. In such an informal selection system, the forester – if there was a forester – would chose the biggest trees and the best species. This informal selction bears the name « furetage », which derives from a name signifying « stealing » – that is, stealing here and there the best trees of the forest. This method, or lack of method, could lead to high-grading, that is, favouring unwanted species and trees with bad genetic dispositions, by overexploiting the best trees and species and leaving the rest to reproduce and fill the gaps.

But archives tell a very different story, including the oldest documents available relating to forestry. Foresters did chose trees not only for profit, but also with an eye on the future, which is the first condition to consider their action as real management. This intensive management system bears the name « futaie jardinée » or « jardinage », which literally means « gardening », and it is an interesting idea that a forest can be tended with as much care as a garden. The word « jardinage » applied to a forestry system first appears in the archives in the end of the 16th Century, as far as we know in a document which first version dates back to 1578 (*Règlement de la gruerie de Mortagne,* 1578-1606).

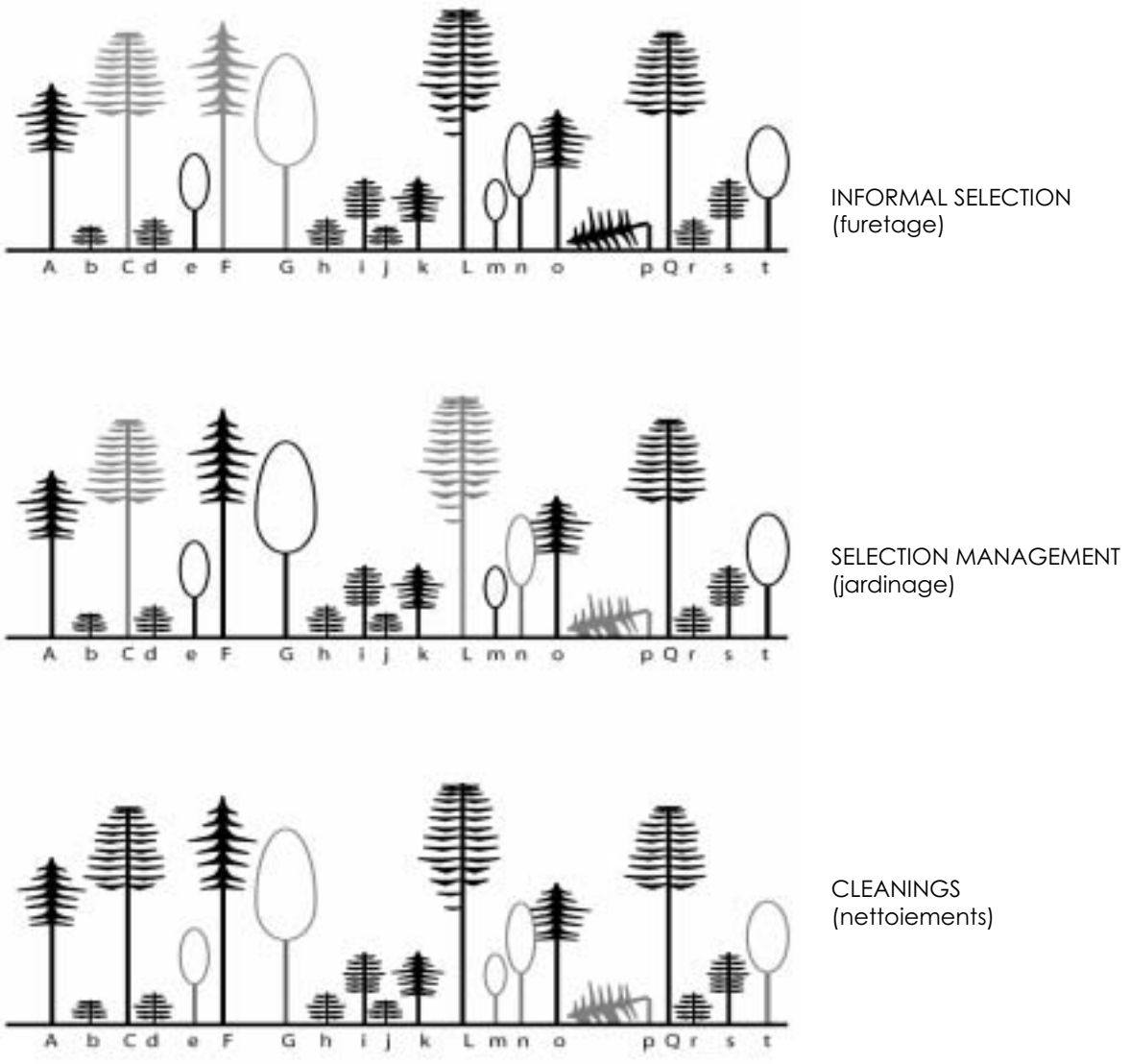


Figure 1. Forestry models in the French mountains, 16th-18th centuries

This complex management system has been described more or less precisely by several historians and geographers in three of the main French mountain massifs – Pyrenees, Jura, Vosges mountains (Huffel 1926; Turc 1950; Fruhauf 1980; Vion-Delphin 2001; Garnier 2004; Rochel 2004).

In the Vosges mountains, forest management was even more ambitious and aimed to clear forests from deciduous species. Fir was the only valuable species; beech and oak were used as fuelwood and did not bring important sums to forest owners. Thus foresters tried to change the compo-

sition of the mixed mountain forests, using selective fellings called nettoiements (cleanings) as a tool against unwanted species. This shows us that selection forestry was not necessarily a close-to-nature forestry, since the aim was to deliberately change the nature of the ecosystem.

In the 18th Century this led to quite complex methods. In each forest, the annual amount of timber exploitation was specified. Sometimes the forest administration or owner would only define the number of full-grown trees that could be felled – so many trees every year; sometimes they would stipulate a minimum diameter under which no tree could be felled; sometimes the system would be even more complex and trees would be classified into three or four diameter classes. Foresters had to fell each year, so many trees of each of the different categories. In the forest of Mortagne, after 1745, the annual timber exploitation would amount to 1500 tronces (the largest trees, more than 45 cm in diameter), 1000 pannes (intermediate trees) and 1500 chevrons (trees less than 25 cm in diameter). Add cleaning fellings, and the need to include windthrows in the annual amount of fellings, and it will be easy to recognize how forest management was a complex, rational work and no elementary custom consisting in picking a few trees here and there.

Thus can we state that selection forestry was:

- common practice in mountain regions, especially in conifer woodlands where the usual management system in France (coppice with standards) could not be introduced;
- quite complex management system, in the hands of foresters and communities.

## 3. Decline and renewal of selection forestry (1669 – 2006)

### 3.1. Two main attacks against selection forestry

In the 17th Century, France was already a highly centralised state, and centralisation means normalisation. Seen from Paris, or rather from the royal palace of Versailles, selection forestry must have looked somewhat archaic and abnormal, since for several Centuries, the royal administration had intended to implement coppice-with-standards as the only forest management system in the realm. Jardinage did not look very different from furetage. It did not occur to the ministers in Paris that forest management was not the same job in the mountains as in low altitudes, and this led to the first attacks against selection forestry.

The first nation-wide attack was the famous 1669 Ordinance, which re-organized forest legislation and administration in the whole realm and became a model of forest laws in all Europe. Conifer forests are not mentioned anywhere along its more than 400 pages; coppice-with-standards was supposed to be implemented in all forests whatever their composition. In the Jura mountains, which had just been incorporated into the kingdom, foresters tried to change traditional selection forestry in order to comply with royal legislation. It led to such disasters that new measures had to be taken, and selection cuttings were quickly re-installed (Vion-Delphin 2001). In the same time, in the Vosges mountains, part of the independent state of Lorraine, the local traditions of selection forestry were continued (Garnier 2004, Rochel 2004).

But the long neglect of selection forestry really started in the 1820s, with a new and complete re-organisation of foretry laws. Forestry science was for some time in the hands of professors of the new Royal Forestry School, established in Nancy in 1824. Nancy was the place where modernisation and normalisation of forestry took place, including the conception of the new model for French forestry: a regular management system, based on shelterwood (futaie régulière).

Once again, state administration and foresters tried to implement the new techniques in all of French forests. First of all, state forests in North-Eastern France – in the surroundings of Nancy– were converted from coppice-with-standards to shelterwood; in a few decades, conversion became the main aspect of modernisation of French forestry. In the Vosges mountains, close to Nancy, selection was almost completely abandoned, even though some prominent foresters like Puton did not see it happen without some regrets for the traditional techniques that had been such a success for several Centuries. Only in higher mountains like the Alps did state foresters consider selection, continuous-cover forestry as useful to protect slopes from erosion and avalanches.

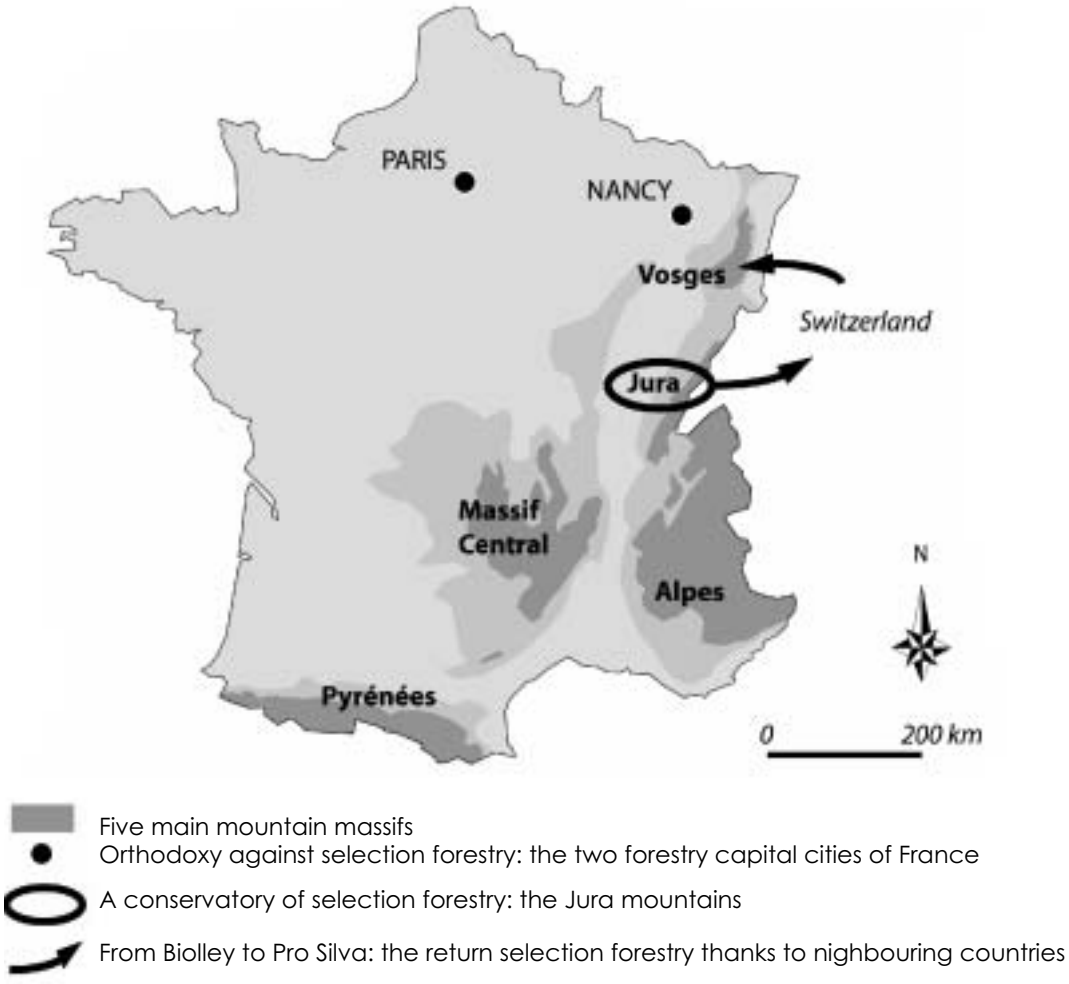


Figure 2. Selection forestry in France, 1578-2006

## 3.2. Conservation and rebirth of traditional management

In the Jura mountains, shelterwood was not accepted as a reliable management system for several reasons. First of all, it was further from Nancy, home of orthodox forestry science; second, forests were – and still are – mostly private, or belonged to local communities; state forests were quite marginal. One could also imagine that the post-1669 disasters, when foresters tried to change traditional techniques, remained in the collective memory and urged foresters and communities to be very cautious when confronted with forestry innovations.

Thus normalisation was not complete, even though France was at that time one of the most centralised states in Europe; and this diversity eventually allowed the rebirth of selection forestry.

Not surprisingly, this rebirth took place in the Jura mountains, in what can be called a conservatory of traditional practices, thanks to several foresters among whom Gurnaud (1825-1898) is most worthy of remembrance. Selection forestry thus claimed its scientific status, not without strong criticism from orthodox foresters. Indeed, Gurnaud did not have much influence in France and his works were mostly spread in neighbouring Switzerland through another prominent forester, Biolley, and his successors.

This helped the developement of a strong tradition of continuous-cover forestry in Switzerland and German-speaking countries, while in France shelterwood remained the most important forestry management system, except for a short period between 1880 and the First World War. Selection forestry came back to France much later, prompted by the success of close-to-nature management and by the action of the N.G.O Pro Silva. The storms of 1999, which devastated much of France's forests, inspired new conversions to irregular forestry, and selection is now considered again as a rational, sound management system.

## 4. Conclusion

One can be grateful that some marginal foresters and local communities managed to make selection forestry survive in some of the French mountain forests, especially in Jura. Forest management traditions were intelligent, cautious and complex, with an eye on a sustainable yield and forest conservation. Indeed, during several Centuries, many considered them as archaic and useless; science and progress had to triumph over that outdated folklore! But the rebirth of continuous-cover forestry shows us that History and Science sometimes repent; as regards selection management, there is an unmistakable continuum between the traditional management systems and the most up-to-date techniques.

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## Woodland management in Bronze Age Scandinavia – evidences from rock-art sites

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### Abstract

In Scandinavia there have always been a problem to breed the cattle during the wintertime. The collection of fodder is crucial and before the invention of the iron sickle we must assume that leaf fodder was the staple fodder during the winter. Charcoal remains like twigs found in Iron Age houses and various tools indicate that leaf fodder was collected in the Early Iron Age in Scandinavia. Most probably leaf fodder was important already in the Neolithic and the Bronze Age, even though the material evidences are poor. In this paper I will argue that the collection of leaf fodder during the Bronze Age is reflected in the pictures on the Scandinavian rock art sites. Of special interest are the rock art sites in the landscape of Bohuslän, western Sweden. In this area we find the most informative rock art sites in northern Europe. The richness of the rock art in northern Bohuslän can only be compared to the famous and informative sites at Val Camonica in northern Italy.

In Bohuslän we find pictures on the rock art sites that give detailed information of the agriculture of the Bronze Age (1700-500 BC). For example the depictions of ards have been studied in detail, and it is obvious – when compared to archaeological evidences – that several different types of ards are represented. Even though this has been acknowledged the pictures of trees on Scandinavian rock art sites have by the majority of scholars been interpreted from a mythological perspective. The tree has a religious significance in many religions and the tree has been regarded as holy or sacred. This mythology is reflected in the pictures of trees on the rock art sites. I will not question this, but I will give a complementary perspective and argue that the pictures also inform us of the practical use of trees in the Bronze Age.

Traditionally the trees on rock-carving sites in Scandinavia have been interpreted as spruce. However the spruce immigrated slowly into Scandinavia from the north and it became a dominant tree first by the Iron Age. In the Bronze Age the spruce must have been a very rare tree in the cultural landscape. The various shapes of the threes on the rock art sites, sometimes having braches and sometimes not, are also hard to explain from this perspective. More reasonably the trees depict pollarded or shredded trees. In some occasions there is a persons standing in the top of the tree that might reflect the actual collection of leaf fodder. There are also pictures that seem to show heaps of branches. Cattle occur in close connection to these pictures. By using information from history and anthropology it is possible to argue that on the rock-carving sites in Bohuslän the whole process of collecting leaf fodder is displayed.

Traditionally medieval church paintings are regarded as the oldest pictures where this process is displayed. If the trees on the rock carvings can be regarded as shredded the rock art give us unique information of the manipulation of trees for specific purposes in the Bronze Age. The consequence is that archaeology can contribute to, and give perspectives on, the history of woodland management in northern Europe. Present day cultural forest is the result of an interaction between man and landscape that goes several thousand years back in time.

# Indigenous Influence on Forest Management on Indian Reservations in the United States

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## Abstract

Until the era of Self-Determination from 1972 to the present, few Indian tribes in the United States were able to influence forest management on their reservations. The Menominee Tribe of Wisconsin is a major exception; based upon legislation in 1908, they were able to force the federal government to implement many ideas that are now popular as part of sustainable forest management. Other tribes have been able to implement their ideas as their control of reservations has increased; the Intertribal Timber Council has an annual symposium at which tribes exchange ideas about forest management.

## 1. Introduction

This paper addresses the question of what impact indigenous ideas had on forest management on Indian reservations in the United States during the nineteenth and twentieth centuries. Because the federal government exerted such great control over reservations during the first two-thirds of the twentieth century, indigenous ideas had little opportunity to influence policy. An important exception was the situation on the Menominee Indian Reservation in Wisconsin, where a fortunate political alliance led to legislation in 1908 that greatly strengthened the Menominee Tribe. As a result, the story of the impact of indigenous ideas on forest policy begins with the story of forestry on the Menominee Reservation.

Partly as a consequence of their own success, the Menominee found themselves in a great crisis in the 1950s and 1960s as the federal government sought to terminate the special legal status of reservations. The Menominee Reservation was terminated first; after years of struggle, the reservation was restored in 1972, an act that signaled the implementation of self-determination on Indian reservations in the United States. After self-determination became federal policy, other tribes were able to implement their ideas in forest management and the story of indigenous influence expands to include many sources.

## 2. Brief history of Indians on reservations

Before examining the efforts of Indians to affect forest management on reservations, one needs briefly to summarize the main periods of federal Indian policy: Segregation to reservations (1830-1880); Allotment (1880-1934); Reorganization (1934-1954), Termination (1954-1972), and Self-determination (1972-present).

During the period of the creation of reservations, policy was to confine Indians to reservations. In the subsequent policy period, reservations were divided into individual or family parcels, called allotments, and much of the remaining land was opened for non-Indian settlement by homesteaders.

The allotment policy applied to most but not all reservations. It was accompanied, in Indian Territory (Eastern Oklahoma), by removal of Indian governments from power. In many ways the allotment policy was more devastating than confinement to reservations. Left alone, Indians could have made good livings on the large land holdings of the original reservations. But having their property systems changed internally via allotment and externally via the homesteading lead to losses of the best land. Some of the land was sold, but often it was simply taken (McDonnell 1991).

The Indian Office established a forestry office under the direction of J. P. Kinney in 1910. The small program, funded at low levels, attempted to set policy direction on all reservations. It opposed allotment of timberlands, usually unsuccessfully. Throughout the early twentieth century, efforts focused on timber harvest, with some attention to sustained yield. On many reservations, harvest continued to support Indian economic activity (Newell, Clow, & Ellis 1986).

Indian poverty caused by allotment was noticed, and policy was changed in 1934 to end the allotment policy and recreate tribal governments. Unfortunately, the form of these new governments was heavily influenced by the Bureau of Indian Affairs under John Collier, creating mismatches between indigenous governance traditions and the new constitutions(Cornell & Kalt 1992). Although tribal control increased, it did not increase a great deal and was immediately placed under attack. A struggle occurred after World War II, and in 1954 when Republicans controlled both the Presidency and Congress, the policy of Termination began. Like Allotment, Termination involved changing the property systems on reservations and removing the reservations from federal jurisdiction. Termination was never fully implemented, because some states opposed it as well as all Indian tribes.

Just after World War Two, the National Congress of American Indians came into existence and became the focus of Indian resistance to bad federal policies. NCAI fought the termination movement in the 1950s and 1960s. A range of regional organizations also came into existence, and worked in tandem with NCAI in leading resistance. Creation of the Office of Economic Opportunity under John Kennedy, and other new national bureaucracies such as the Economic Development Administration under Lyndon Johnson created alternative ways for Indian tribes to obtain federal support for their activities.

Resistance to control of reservations by the federal government received a great boost from Richard Nixon, who advocated self-determination. He approved of measures to reverse termination, such as the restoration of the Menominee to reservation status. He also supported returning lands to tribes that had legitimate claims, such as the Taos Pueblo (Gordon-McCutchan 1991). While the original Self Determination Act was a compromise between those in favor and those against Indian control of their reservations, it started a process by which many tribes could take over effective control of their reservations, and was subsequently amended to increase that control.

### 3. The Menominee Exception

The Menominee Tribe's history intersected national policy in different ways. Menominee escaped the bad effects of the allotment period, but was the first of the tribes to have its reservation terminated. It was also among the first of the tribes to have the reservation restored when Nixon implemented self-determination.

During the allotment period, commonly an elected national delegate in the House or Senate sponsored a bill that carried out the allotment policy on a particular reservation in his state. Although the General Allotment Act authorized allotting lands, it did not explicitly open up remaining lands

for settlement. In addition, each reservation presented special issues not covered by a general act. When Indian leadership opposed allotment, and when another elected official (Senator or Representative) from a state agreed with them, this strategy did not work. Menominee leaders had been protecting their forest from harvest throughout the second half of the nineteenth century, achieving limited success. When Senator Philetus Sawyer and Representative Guenther, of Wisconsin, introduced a bill to allow private companies access to Menominee timber, Senator Bob LaFollette, also from Wisconsin, prevented them. He later sponsored an act which embodied the main points of sustainability that Menominee leaders wanted. (Davis 2000, 132-135).

The LaFollette Act of 1908 structured the entire subsequent struggle of the Menominee to resist non-sustainable harvest practices on their reservation. It contained language that assured a sustainable cut of live timber, and authorized establishment of a tribal mill. The creation of a tribal mill contradicted another tenet of the allotment era: "breaking up the tribal mass" as President Theodore Roosevelt expressed it. Tribal governments were removed from power in Indian Territory. Individual Indians were to become self-sufficient by allotting them individual plots of land. For the Menominee to manage their land as a unit, with a mill owned and run by them, would not and did not dismantle the tribe.

## 4. Consequences of the Menominee exception

A number of indigenous ideas were able to achieve implementation on the Menominee reservation: cutting at a rate consistent with long term sustainability, selection cutting (also known as uneven aged management), long term monitoring, and subordination of a mill's goals to the goals of forest management. Each of these contribute to sustainable forestry, and each of them was not consistent with mainstream forestry in the United States. Although other tribes were able to use these ideas to a limited extent, the special legal situation on the Menominee reservation gave them an advantage. On other reservations, the authority of the BIA was much greater during allotment, reorganization, and termination.

### 4.1. Harvest Rate

At a time when the standing forests in Wisconsin and Minnesota were being harvested at a high rate and converted to farmland or to young stands of trees, the forest on the Menominee Reservation was not "liquidated" in this manner. The first legislation which allowed the cutting of green timber on the reservation, in 1890, specified that the cut could not exceed 20 million board feet a year. Timber interests supported this low number because they thought that it restricted the Menominee to that amount of timber, leaving the rest for them (Davis 2000, 130). That cut actually approximated the growth rate of merchantable timber at the time on the Reservation, and hence represented a sustainable rate of cut. It became the maximum allowed cut.

The Menominee Forest was never fully "converted" to management on a rotation age that approximates either maximum sustained yield or maximum sustained economic return. When the Bureau of Indian Affairs attempted such conversion in the 1910 and 1920s, they ran afoul of the provisions of the LaFollette Act of 1908, because they harvested at a rate above 20 million board feet. The Menominee sued, and after a substantial period in court, won.

At places other than the Menominee Reservation, foresters in the BIA interpreted their legal authority of determining the cut to be based on biological criteria of sustained yield, which limited the calculation of sustainable harvest by not allowing "conversion" of the standing trees to intensive forestry that had rotation ages determined by an economic calculation. This changed

in 1964, when a new law (78 Stat 186) allowed harvest of "commercially mature" timber, not just "overmature" timber. As a result of this law, the Menominee view on how to calculate annual allowable cut changed in the Bureau, and much higher cuts were calculated for many reservations. This period of "intensive forest management" represents a time when most tribal priorities for their forests were subordinated to timber production.

### 4.2. Selection Harvest

The US Forest Service, when it briefly participated in forestry on the Menominee Reservation, explored the idea of "selection harvest," taking a portion of a stand and leaving the rest to grow, as early as 1917 (Davis 2000). While local superintendents tried to harvest with clear cutting and a higher rate of cut, they were stopped by litigation. Meanwhile, the idea of selection cutting became the idea of "uneven aged management," which the BIA included as one of the options to use on Indian reservations. After World War II, when the idea of converting forests to intensive management through extensive use of clear cutting gained dominance in the forest sector, the option of uneven aged management remained strong on reservations.

### 4.3. Long term monitoring

In the early 1950s, while the termination movement was in full swing, the Branch of Forestry implemented the idea of Continuous Forest Inventory, known by its initials, CFI. The CFI program established permanent plots on all forested reservations, designed to enable the BIA to estimate average growth on the reservation. The idea seems to have originated at Menominee; it was accepted across the BIA forestry program. Every ten years, the permanent plots are measured and growth rates estimated. These data provide excellent bases for empirical growth and yield modeling. As forest budgets came under severe pressure in the late twentieth century, preservation of the CFI system remained key and received much support from tribal forestry.

### 4.4. Forest goals dominate industrial goals

A much-noted feature of forest management on the Menominee Reservation is that the foresters determine what to cut without consideration of the needs of the lumber mill. The mill has to adjust its plans to utilize or resell that which the foresters determine will be harvested (Pecore 1992).

### 4.5. Use of prescribed fire

Although a portion of the Menominee forest consists of pine, the use of fire to manage pine stands was not part of the Menominee management strategy. Until stopped, fire was used on the Colville and White Mountain Apache reservations.

### 4.6. Overview of Indian influences

While these five examples show that in a limited way Indian ideas influenced forestry on some reservations, the overall power of Indians to affect forest policy was small. The sad tale of indigenous people being pushed out of the forest on the Yurok reservation, for instance, was more common than the heroic story of the Menominee defense of their forest (Huntsinger & McCaffrey 1995).

## 5. The Impact of Self-Determination

The termination period of the 1950s and 1960s changed quickly into a period of self-determination. Part of the reason for the change was the resistance Indians made to termination and the development of the NCAI into an effective organization. Another influence was the Office of Economic Opportunity, during John F. Kennedy's administration. The OEO funded activities on reservations that were not under the control of the BIA, or of tribal councils, and activists on reservations were able to begin new activities and to resist existing policies.

Unlike in previous transition from a Democratic to Republic administrations, new Indian policy under Richard Nixon strengthened rather than reversed the movement toward self-determination. Intertribal organizations proliferated, including the Intertribal Timber Council, discussed in the next section.

During Nixon's administration, many struggles of American Indians to obtain land and control of their reservations reached positive conclusions for Indians. The Menominee Tribe had its federal status restored. The Taos Pueblo obtained Blue Lake and the land around it from the US Forest Service(Gordon-McCutchan 1991). The Hualapi and Havasupai obtained land near the Grand Canyon (Keller & Turek 1998). Terminated tribes in Oregon also began to obtain federal recognition. The American Indian Policy Review Commission laid out an agenda of change, many components of which were implemented during the next twenty years.

Just as Indian tribes were strengthening their control of reservations, Stephen Pyne published Fire in America (Pyne 1982), with its significant recognition of the role American Indians had played in creating the landscapes encountered by Europeans. Other publications followed. Although Henry Lewis had been working on the role of fire prior to Pyne, his first publication in 1973 coincides with increasing self-determination by Indians(Lewis 1973).

The large outpouring of scholarly work on traditional knowledge post-dates indigenous activism. Did Indian self determination assist in turning scholarly attention to their ideas? Establishing a causal connection between the increasing recognition of Indigenous influences on 'nature' and Indian social action is somewhat difficult. On the scholarly side, D'Arcy McNickle and Vine Deloria began the process of reinterpreting Indian history in advance of self-determination. McNickle's first history book came out in the 1960s (McNickle 1962), and Vine Deloria published Custer Died for Your Sins in 1970 (Deloria Jr 1970).

## 6. The Intertribal Timber Council

After the start of the self-determination movement, and as part of it, a group of Northwest Indian Tribes, lead by the Quinault in particular, organized the Intertribal Timber Council in 1976. In an effort to change the thinking of the Bureau of Indian Affairs, as well as to share ideas among the Tribes, the ITC began a series of annual symposia, and published the proceedings of each of them. These proceedings are excellent source material for tracing the gradual change in BIA policy as well as gradual change of the direction of the management of forests on Indian reservations. Funded primarily by the BIA, the ITC could not move too dramatically to change things, nor did its leadership believe that rapid movement was needed. The ITC became one of the main lobbying forces to preserve and extend the amount of funding for forestry in the BIA.

I have attended many of the annual symposia of the ITC. My impression is that in its early years, and even to an extent recently, the ITC has been heavily influenced by a timber-orientation, even though tribes clearly have been interested in other matters in forests.

By design, the ITC is not an advocate of any particular forest policy; the sovereign powers of individual tribes means that tribes are the source of policy proposals, not the ITC. Only if a consensus has been reached among the members of the ITC does it coordinate an effort to affect federal policy. Member tribes did this in connection with a major change in federal policy regarding forests on Indian reservations with the National Indian Forest Resources Management Act (Title III of Public Law 101-630, November 28, 1990).

The National Indian Forest Resources Management Act required that a national study be done; this requirement resulted in An Assessment of Indian Forests and Forest Management in the United States, by a team that named itself IFMAT. The Indian Forest Management Assessment Team completed one report in November, 1993, and a subsequent report in 2003(Indian Forest Management Assessment Team 1993;The Second Indian Forest Management Assessment Team 2003).

The first report documented that Indian people and the foresters in the BIA had different priorities for the management of forests. Indian people tended to prefer "protection" and the use of forests for "subsistence." The non-Indians in the BIA, and Indians to an extent, believed their clients preferred income and the use of the forests to provide income. (IFMAT I, 1993, pp. III-3 and III-4). The groups converged by the time of IFMAT II, with non-Indians moving toward Indian values. In their summary of IFMAT II, the team stated:

The timber-production focus of the past has begun to give way to integrated resource management to better fit the visions of tribal communities (p. 102).

They also say the following:

> . . . the conditions of Indian forests can also yield valuable lessons for society in general; indeed, Indian forests have the potential to be models of integrated resource management and forest sustainability from which we can all learn (IFMAT II, 2003, p. 102).

The proceedings of the annual timber symposia of the ITC can provide excellent material for assessing the flow of traditional forest related knowledge into the forestry profession.

### 7. Individual Tribal Contributions

With the increase in tribal self-determination, each of the tribes with major timber holdings have the ability to innovate themselves in the selection of policies for their forests. The NIFRMA, in section 3104, allows tribal goals to dominate the management of forests on their reservations. The law also uses standard language, namely "sustained yield," which allows convention al definitions of that term to dominate should a tribe not insist on another basis for forest management planning.

I am familiar with the innovations introduced by my own tribe, the Confederated Salish and Kootenai Tribes, in the first Forest Management Plan on the reservation that the Tribes fully controlled. The Tribal Council had refused to approve the previous plan, written by the BIA, because of objections to the timber emphasis. The new plan has several innovations. The entire forest is classified by fire regime, which is viewed as a fundamental ecological characteristic. The fire regimes are classified by the pre settlement frequency: every few years, with frequency of 30-50 years, 100 years, and the timberline regime, which was on the order of every 300 years. The first three regimes are the ones that mattered for commercial forestry. Treatments were planned based on fire regime requirements and the type of diversity desired. The alternatives for the plan focused upon variations on ecological restoration, which were compared to a timber emphasis (the previous plan) and a no-cut option that many wanted to be considered. The selected alternative involves ecological restoration with

some timber harvest, a compromise among ecological and economic objectives. The Tribes fully complied with the National Environmental Policy Act with a complete environmental impact statement process(Confederated Salish and Kootenai Tribes 2000;Tecumseh Professional Associates 1999).

Other tribes have innovated in other ways. The BIA has funding to support one integrated resource management plan (IRMP) per year (IFMAT II, p. 90.) While this level of support is small, the IRMP process allows consideration of a full range of objectives. Another study could examine the incorporation of traditional knowledge into forest plans on reservations, now that tribes control the planning process to a greater degree.

## 8. Conclusion

One of Bruno Latour's main points in Politics of Nature is that consideration of a wide range of ideas in collective decision-making arenas is fundamentally a political process. His subtitle is "How to bring the sciences into democracy." In the United States, the influence of traditional knowledge tracks with the political power of indigenous peoples. When they were under domination, their ideas were excluded from forest management. The assertion of self-government powers by indigenous peoples in the United States creates more political space for the ideas of those peoples.

During the height of the colonial policies of the US government, Indian ideas had few opportunities to be implemented. Because of unique political circumstances, support from Senator Bob LaFollete, the Menominee were able to employ their concepts of forest management because LaFollete had created a legal basis for them to enforce sustainable harvests. Without that condition, the history of forest management on Indian reservations show a domination by non-Indian values. Only the ideas of uneven aged management and long term monitoring received significant implementation. Use of fire, restriction of harvest rates to sustainable levels, and subordination of the agenda of the mill to that of the forest was not widespread before self-determination came into force.

Once self-determination restored Indian control of forest decisions, a new set of conditions has allowed traditional knowledge space to be recognized. Whether it is utilized or not depends greatly upon the political process within each tribe. This paper has not presented a tribe by tribe analysis; such a study of current developments would be quite interesting.

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# Koguryo civilisation sustained by forest culture in the northern Korean peninsular and Manchuria

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## Abstract

Based on the concept of forest culture, several cultural phenomena related to forests and trees in Koguryo civilisation have been brought into research. The mural paintings on ancient Koguryo tumuli, which had been depicted from the early 3rd century to the mid 7th century, provide a good amount of data for the forest culture study. The Tree of Universe in mural paintings should be the Shindan Tree, an important component of the Narrative of Dangun, the first forefather of Korean people, who was and is believed to have lived five thousand years ago in historical documents, legends, and folk religion. As depicted together with a guardian deity on the northern mural wall and planted exteriorly surrounding the tumulus, pine should have been a royal tree with high economic utility. The biogeography different from the Chinese mainland indicates that the pines must have been mostly Pinus densiflora and Pinus koraiensis. The tree standing together with the deities of civilisation in the paradise resembles Koguryo's mural pine. The tree adds another importance of pine in the spiritual dimension of Koguryo's forest culture. Hunting utilised forests as a spatial provision where royal, military, and religious functions are all played. In some mural paintings, wooden buildings as well as wooden structure upon castle walls are represented. Wood from the Koguryo's forests must have been consumed for the building and renovation of palaces, mansions, national shrines, and Buddhist temples as well as commercial and military ships.

## 1. Introduction

Humans have maintained the inseparable relationship with forests and trees from the pre-historic period to the modern times. The modes of interaction between forests and humans for each age and civilisation have various forms and fashions (Perlin, 1989; Harrison, 1992; Menzies, 1994; Schama, 1995). Forest culture sustained ancient civilisations. Koguryo civilisation can be brought into a study on the spiritual and materialistic dimensions of forest culture. The Koguryo kingdom had initiated in the region surrounded by forests and mountains in the mid-Amnok river region on the border between North Korea and China (Figure 1), expanded in four directions into the southern and midland Manchuria and the northern part of Korean peninsula, including Pyongyang, and lasted for more than seven hundred years (1st century BC – 7th century AD) (Kim, 1145; Koguryo Research Foundation, 2004).

It is exceptional, if not exclusive, in the history of the Northeast Asia that Koguryo people have left a good amount of mural paintings with high qualities from a global perspective among the capitals like Kungnaeseong, and Eastern and Western Pyonyang and the surrounding regions. The Koguryo mural paintings have been designated as the World Cultural Heritage by UNESCO (Perrin, 2004; Rii, 2004). The mural paintings that we can observe on inner granite walls and ceiling of the ancient Koguryo tombs had been depicted from the late 3rd century to the mid 7th century AD (Jeon, 2000, 2004a, 2004b). It is paradoxical that mural paintings reflect not only the spiritual or religious beliefs, but also the everyday customs of the Koguryo society at the time of tumulus construction. The space of the living exists in the space of the dead.


Figure 1. Koguryo and its capital regions
(Jolbon, Kungnaeseong, and Pyonyang)

## 2. Methods: Forest Culture, Mural Paintings, Historical Documents, and Tree Biogeography

The totality of the interaction between forests and humans can be grasped by "forest culture" (Chun, 1997, 2005), a useful concept for delineating, describing and analyzing cultural phenomena related to trees and forests in spiritual and materialistic dimensions. The forest culture for a civilisation can be historically reconstructed based upon the synthesis and coalescence of various sources, including not only the traditional historical sources, but also the other disciplinary sources and knowledge. In the case of Koguryo civilisation, the availability of the mural paintings allows us to overcome a paucity of the textual evidence in ancient historical documents, both Korean (Kim, 1145; Ilyon, ca 1280; Yi, 1287) and Chinese (NHCC, 2004) and provide the advantage of using images and drawings to identify the cultural elements, both general and forest and tree-related. A number of color and black-white pictures and replica drawings have been collected (Chosunilbo, 1993; Seo, 1998; Jeon, 2000, 2004; Gongju National Museum, 2004; Koguryo Research Foundation, 2004a; Minmunhyop, 2004; Lee, 2004). Individual objects with elements of forest culture have been analysed in-depth with the textual evidences in ancient historical documents and brought into the light of the theory and knowledge framed by Koguryo historians and the other experts. To help identify the tree species depicted in the mural paintings, the biogeography of the pines (Critichfield and Little, 1966; Mirov, 1997) and dendrology (Lee, 1986; Lee, 1995) have been employed.

## 3. Results and Discussion: Elements of the Forest Culture Identified in the Mural Paintings

### 3.1. The Tree of Universe and the Dangun Narrative

The Tree of Universe or the sacred tree is a common motif universally appearing in the forest culture over the globe (Chun, 1997, 2005). In the Koguryo mural art, the Tree of Universe stands between two different thematic sections in a complete mural art on a wall (Minmunhyeop, 2004) or in a central locus among other everyday activities (Jeon, 2000).

Figure 2. The Tree of Universe in a mural painting (Source: Minmunhyeop, 2004)

In one mural art, a bear and a tiger are depicted to be standing around the Tree (Figure 3 and 4), while, in another, a bear crouching inside a cave appears under a minimalised mountain on which the Tree of Universe stands firmly (Figure 5).

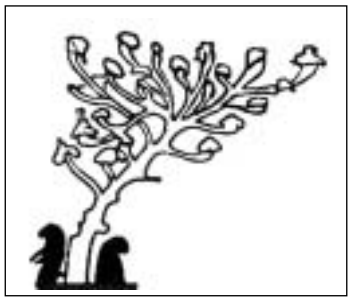

Figure 3 (left). The Shindan Tree and the Dangun Narrative 1 (Source: Minmunhyeop, 2004)
Figure 4 (middle). A replica of the Shindan Tree, tigress and she-bear (Source: Koguryo Research Foundation, 2004)
Figure 5 (right). The Shindan Tree and the Dangun Narrative (Source: Lee, 2004)

The big tree, bear, tiger, and cave are important components in the Narrative of Dangun, the first forefather of Korean people, who is still believed to have lived about five thousand years ago in folk religion. A few versions of the Dangun Narrative are recorded in the old Korean historical documents, including Samguk Yusa (Ilyon, ca. 1280) and Jewangwoongi (Yi, 1287).

"…With three thousand of his royal subjects Hwan-ung [a son of Hawan-in, the Heavenly Emperor] descended from heaven and appeared under the 'Shindan Tree' on Taebaek Mountain. He named the place "Shin-si"(city of god)… In those days there lived a she-bear and tigress in the same cave. They prayed to Shin-ung(another name of Hwan-ung) to be blessed with incarnation as human being. The king took pity on them and gave them each a bunch of mugwort and twenty pieces of garlic… In twenty-one days the bear, who had faithfully observed the king's instructions, became a woman. But the tigress, who had disobeyed, remained in her original form… Hwan-ung heard her[the woman's who had been transformed from the former she-bear] prayers and married her. She conceived and bore a son who was called Dangun Wanggeom, the King of Shindan…" [short explanations and emphases inserted by the author of this paper] (Ilyon, ca. 1280)

The Tree of Universe is interpreted as the "Shindan Tree" in the Dangun Narrative, "Shindan" meaning either a godly alter (Ilyon, ca. 1280) or a godly tree (Yi, 1287). This interpretation provides a corollary that the mural artists and probably the Koguryo society in general knew well about the legendary figure Dangun who was regarded as the initial builder of the old Joseon before Koguryo itself. The recent advance in the historical research suggests that the old Joseon or Gojoseon be actually three succeeding kingdoms located in the Korean peninsular and Manchuria, spanning 21$^{st}$ century BC to 1$^{st}$ century BC (Dangun Society, 2005).

For the biological nature of the Shindan tree, "bakdal" in Korean or sandalwood(Betula shimidtii) and "neuti" or zelkova (Zelkova serrata) have been proposed. It was suggested that this tree should be "garae" in Korean or Manchurian walnut (Juglans manschurica, Maxim.) (Jeon, 1997). This tree species is commonly found to be growing in the central and northern Korean peninsular and southern Manchuria, including Jian (Lee, 1986; Lee, 1995).

### 3.2. Pine, the Spiritual and Material

Pine should have been a royal tree with high economic utility. Ancient Korean and Chinese documents describe that the Koguryo people had planted pines exteriorly around their ancestors' stone-mound tumuli (Kim, 1145; NHCC, 2004). The pine planting of Koguryo people has descended down and evolved into a conserved custom of the later Korean kingdoms like Koryo [918-1392 AD] (from which the Western names Korea or Coreé have come into existence) and the recent Joseon [1392-1910 AD] (Chun, 2004, 2006).

In a later-period mural painting, two pine trees are present around one of the four guardian deities, "Hyunmoo", a hybrid of snake and turtle and the North deity painted on the northern wall (Figure 6). In a different context, pine appears on a small mountain or garden around a pond (Jeon, 2004).

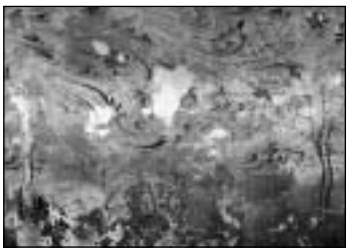

Figure 6. (left)
A replica of pine together with Hyunmoo in Jinpari Tomb N$^{O}$ 1.
(Source: Gongju National Museum, 2004)
Figure 7. (right)
Shape of the Korean red pine (Pinus densiflora)

The pine species in the mural art is identified as Korean red pine with its Latin name Pinus densiflora (Figure 7). And the red pine and Korean pine (Pinus koraiensis) must be the species that had been planted around the tumuli. The current natural distribution of Pinus densiflora and Pinus koraiensis covers Korean peninsula and Manchuria (Critichfield and Little, 1966; Mirov, 1967).

Different pines must have been employed in different importance for the building and maintenance of Korean and Chinese civilisations (Yi, 2005). Different from Korean pines, Chinese pine (Pinus tabulaeformis), Masson's pine (Pinus massoniana) and whitebark pine (Pinus bungeana) should have importance in Chinese forest culture, in which "shamu" (Cunningamia lanceolata) and cypress (Thuja orientalis), the arbor vitae of the Chinese people, have been more important than pines (Menzies, 1994).

### 3.3. Pine-like Paradise Tree and Deities of Civilisation

In some mural paintings, there appear a variety of deities or ultrahumans called "shinsun", including those of sun and moon and those riding on an auspicious animal like dragon. There are also the deities of civilisation: that of wheel (or vehicle), that of masonry, blacksmith deity, deity of agriculture with a bull head, and a deity of fire (or tree). These deities are depicted to stand among paradise trees and animals.

Figure 8.
Pine-like paradise tree among a deity of civilisation
(Source: Jeon, 1999)

The paradise trees, especially the one depicted surrounding the deity of fire or tree (Figure 8), indicate that they are a modified form of pine in terms of the drawing strokes and styles as in the mural pines. The leaves and crown of the pine-like tree seems to be colored in a diverse pattern to represent the ideal paradise or the world beyond this world.

### 3.4. Hunting, the Royal and Military Sport

Hunting scenes are frequently displayed in the mural paintings, which reflect the importance of the hunting events in the Koguryo society with distinctly strong Koguryo bows and shrewd horseback archery among its people (Figure 2 and 5). Historical documents have it that Jumong or Choomo, the first king of the Koguyro kingdom, was the best archer of all times (Kim, 1145). Hunting in forests and mountains has royal and military meanings as well as a way of securing some ritual animals for ancestor worship at the national shrines (Kim, 1145).

### 3.5. Buildings and Ships of Wooden Structure

Koguryo palace buildings and other wooden buildings in an aristocratic mansion are also depicted in the mural paintings. Historical documents record that there were many big wooden buildings like the royal palaces of the Koguryo kingdom, its national shrines, nobility's mansions, and Buddhist temples, which had been devastated in wartime and constructed or renovated in peace by kings and the ruling class (Kim, 1145). In a mural painting, the castle of Kungnaesung with the Gates' wooden structures is seemingly depicted. Koguryo is famous for its castles and fortresses constructed with tailored stone cubes.

There are a few international maritime activities recorded in the historical documents concerning Koguryo (Kim, 1145). However, material and human exchanges between Koguryo and some Chinese dynasties and kingdoms must have been carried out in peace and wartimes by way of the Yellow and Bohai seas. Hence, many military and commercial ships of mostly wooden nature must have been constructed for the court envoys, international trades, and domestic purposes.

## 4. Conclusion: Koguryo Civilisation Sustained

Many interesting cultural phenomena related to forests and trees are identified in ancient mural paintings of Koguryo. Elements of the forest culture are mostly in mural arts of the early-period (from the late 3rd century to the early 5th century), but also identified from the mural paintings of the later period (from the mid 5th century to mid 7th century) (Jeon, 2000, 2004a, 2004b). It is evident that the forest culture had been an important component of the Koguryo civilisation, with strong spiritual and materialistic dimensions manifested in the Shindan Tree, pines, paradise tree, hunting, and wooden buildings and ships.

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# Theme 2.
# CONFLICTS BETWEEN TRADITIONAL FOREST KNOWLEDGE AND SCIENTIFIC FORESTRY

# The uses of forests and woodlands in New Spain from 16th to 18th centuries[1]

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## Abstract

From the study of conflicts between *pueblos de indios* (Indian villages), cities, mining districts, and haciendas for the use and property rights of forests and woodlands, in New Spain (colonial Mexico) from the 16th to the 18th centuries, it is possible to determine the significance of the forest for different groups of the colonial society (colonial authorities, Indians, miners and cattle and *hacienda* owners). For indigenous communities, forests and woodlands provided food and shelter (timber, edible roots, mushrooms, animals for meat and fur, medicinal plants, honey and wax); whereas most of the Spaniards considered these places were only good for supplying timber, firewood and charcoal (for building, mining, heating and cooking). These different perceptions of the usefulness of these areas explain in part the long struggle, largely through litigation, for the possession and conservation of the forests and woodlands held by the indigenous *pueblos*. The case studies undertaken in this project allow us to appreciate the effects of changing uses of the woodlands during the colonial period on the landscape and on the economic interests of users and owners, and to explain some of the reasons for the conflicts thus produced.

## 1. Introduction

In Mexico, during the colonial period, forests and woodlands located in areas surrounding mining districts were intensely exploited, supplying timber, firewood and charcoal for the mines. Wood was also taken from the same places, to supply timber for building houses and as fuel for the domestic use of the inhabitants. Also, livestock brought in for food and transport were occupied and transformed the woodlands (Cook 1949a and 1949b; Melville, 1994; Sluyter, 2001). Similar phenomena occurred around cities. Deforested sites were turned into agricultural fields supplying crops to local markets and beyond. Crops planted in places previously occupied by trees, and timber felling, supplied the growing demand for cereals and building materials required as the population increased (Arregui, 1980). There was however, no corresponding increase in the number of trees to match the growing demands of the population; as a result there were many conflicts over the conservation and use of the forest. There is a very close relation between the rising demand for cereals and timber, and the number of complaints brought by the Indian *pueblos*, to secure the use of the woodlands. Some of the legal suits lasted as long as a century though many were resolved in the course of a year.

## 2. Forest property and use conflicts: 1521-1819

The period of study is from the date of the first to that of the last document on the use and property rights of forests and woodlands, held in the National Archives (AGN) for the Colonial Period (1521–1819) (See Table 1.).

[1] This paper reports the early results of an ongoing study on the uses of forest and woodlands in Mexico during the Colonial Period.

Table 1. Conflicts over the use and property rights of forests and woodlands in New Spain, 1542-1819

| Years | 1542-1600 | 1601-1700 | 1701-1819 | Total |
|---|---|---|---|---|
| Number of conflicts | 10 | 29 | 117 | 156 |

Source: Archivo General de la Nación, Tierras

The study of the litigations recorded in these papers shows the long process in the course of which Indian villages lost the possession and the rights of use of the woodlands. The different types of conflict that arose may be distinguished on the basis of which parties were involved. Each type of conflict has to do with one of the main economical activities introduced with the Spanish colonization. (See Table 2.).

Table 2. Types of conflict.

| | 1542 – 1600 | 1601 – 1700 | 1701 – 1819 | Total |
|---|---|---|---|---|
| Pueblo vs. pueblo (Indian Village) | 2 | 1 | 9 | 12 |
| Pueblo vs. estancia (Cattle) | 4 | - | - | 4 |
| Pueblo vs. authorities | 2 | - | 7 | 9 |
| Timber merchants or loggers vs. pueblo or city | | 7 | 5 | 12 |
| Pueblo vs. hacienda or smaller ranch | | 10 | 62 | 72 |
| City or neighbourhoods vs. pueblo, ranch or hacienda | | 2 | 9 | 11 |
| Hacienda vs. hacienda or smaller ranch | | 3 | 7 | 10 |
| Taxpaying Indians vs. haciendas | | | 8 | 8 |
| Logging permits | | 4 | 4 | 8 |
| Other (inspections, forced agglomeration, sales, inheritance) | 2 | 2 | 6 | 10 |
| TOTAL | 10 | 29 | 117 | 156 |

**Source: Archivo General de la Nación, México, Tierras**

In general terms, during the 16th century mining and cattle raising were the principal causes of competition and conflict between the various parties. In the 17th century the expansion of cities and of agriculture caused further tensions. In the 18th century it was mainly the expansion of the *haciendas* that caused conflicts, which were also more violent. Over the whole period rights of use were whittled away in favor of property rights, first by the creation of common use and then by giving more weight to titles.

In this process of change we can distinguish four moments of tension, by noting the kinds and the quantities of conflicts recorded, and seeing how they correspond to important changes in the use and proprietorship of the woods. Changes in the law are also considered, as good indicators of these transformations, and these also allow us to determine the moments when the changes took place. (See Table 3.).

Table 3. Main changes of use and property rights

| | PARTIES IN CONFLICT | PRESSURES | USE AND POSSESSION | THE LAW |
|---|---|---|---|---|
| 1550 → | Pueblo – Pueblo<br><br>Pueblo – Cattle<br><br>Pueblo – Mining | Increased demand by mines for wood<br><br>Cattle invade woodlands and crops | The conflict is not for possession of the woodlands but a question of jurisdiction based on the principle of established or traditional use | Woodlands, pastures and water deemed to be of common use (1541) |
| 1650 → | Pueblos – Sugar mills<br><br>Pueblos – Haciendas<br><br>Pueblos – Timber merchants and Inhabitants of cities and villas (smaller towns) | Increased demand for wood (cities, sugar mills, vehicles and fuel) | The right to possession of the land and woodlands by Indian villages starts to be encroached on | Restrictions on the common use of woodlands introduced (in the case of smaller areas) |
| 1720 → | Pueblos – Ranches<br><br>Pueblos – Haciendas | Crops take over woodlands (changes to land use and landscape) | Property rights start to be given more weight in the resolution of conflicts | Rights of use "from time out of mind" giving way to possession for "a year and a day" (1722) |
| 1760 → | Pueblos – Haciendas<br><br>Pueblos – Ranches<br><br>Taxpaying Indians – Haciendas | Pressure on the land<br><br>Vague boundaries propitiate loss of land by Indian villages | Rights of use subordinated to property rights | Rights to common use of pasture suppressed and the rights to use woodland restricted to personal needs only (1756)<br><br>Spanish law abolishes the principle of common use of woodlands (1813) |

## 2.1. Cattle ranching and mining

The first moment of tension in our survey starts around the year 1550. The principal plaintiffs were the Indian villages. They quarreled with other *pueblos*, with the cattle *estancias* recently established within the *pueblos*' own jurisdictions, and with the inhabitants of the emerging mining districts. Pressures on the woods correspond to an increased demand for wood by the mines and to the invasion of woodlands by livestock.

The cause of the conflicts was not a dispute for possession, but a question of jurisdiction based on the principle of established or traditional use. In 1541 a new law, ratified in 1550, established that "woodlands, pastures and water are deemed to be of common use" (Recopilación de leyes de los reynos de las Indias, ley V, tit. XVII, lib. IV). Everyone was now able to enter into the woods, and such common use became a restriction on the jurisdiction held by the *pueblos* over their woodlands, pastures and waters.

A good example of the loss of jurisdiction and also of traditional woodland use is the complaint brought in 1563 by the *pueblo* of Tlapanaloya against Gerónimo Cataño, a sheep owner (AGN, *Tierras*, vol. 1525, exp. 1. f. 90v.). The testimonies provided by the Indians concluded that the introduction of animals was most pernicious because the sheep ate and destroyed the roots and the leaves of the plants that the Indians collected for food or to sell in the local market. This case provides information on the – long lasting – effect of livestock on the woodlands during the 16th century, due to the erosion of the soil by the animals. The other problem at this time is related to mining and has to do with a more intense exploitation of charcoal, firewood, and timber for the mines. Finally, with the introduction of new users, other than the traditional users, there were conflicts between neighbours. In this first period, with the transformation of many traditional uses, the landscapes also were altered.

## 2.2. Urbanization

In the middle of the 17th century new actors appeared: sugar mills, *haciendas*, fur and leather tanneries, merchants and the inhabitants of cities and *villas*. Pressure on the woodlands was now due to an increased demand for wood to meet the needs of cities and sugar mills, for timber and fuel. Another fact contributing to increased tension over woodlands is that as the number of *haciendas* increased, their owners started to fight against common use practices in private lands and woodlands, the right to *possession* by Indian villages began to be encroached on and the law itself introduced some restrictions on the common use of woodlands (for example, in the case of smaller wooded areas). The demographic recovery of the Indian population is another factor that contributed to the pressure on woodlands; many Indian villages sued for protection, while others resorted to violence. In either case, they now had to fight for their rights of use.

This type of conflict shows who the new owners and new users of the woodlands were. The law was not very clear, and many logging permits for users were issued by local authorities, while the traditional owners of the woodlands sought protection from the metropolitan and central authorities who tried to reconcile the rights of use to those of property. Conservation and reproduction rules were constantly referred to, and appeared in every permit granted. The parties in conflict in this second period introduced the idea of conservation, which they learned to use in order to protect their property, or their rights.

In 1653, for example, Pedro de Eguren, an *hacendado* and sugar mill owner, complained against the owners of the tanneries for destroying his trees, especially the *encinos* (a kind of oak). The central authorities defended the right of entry of the *hacienda* into the woodlands, but the new users presented the permits they had obtained from the local authorities. What the court resolved was just to change the place of exploitation to outside *hacienda* lands; i.e. they did nothing to revert the tendency for traditional uses to be supplanted by new ones (AGN, *Tierras*, vol. 3431, exp. 1, fs. 4v.-5).

## 2.3. Agricultural expansion

In 1720 the commonest complaint was between *pueblos* and *haciendas*. The scarcity of land and the increased demand for cereals (for a population in expansion) go some way to explaining why more woodland was being lost to crops. At this point property rights start to be given more weight in the resolution of conflicts. There are two examples to illustrate this: first, a conflict between a *pueblo* and an *hacienda* that lasted from 1720 to 1724. The conflict took place on the Northern Frontier of New Spain, at Mezquitic, where the *hacienda* brought a case against the Indians who took the wood that the *hacienda* had cut down. But the Protector of the Indians found that the rights of use of the *hacienda* should be discounted because of the small size of the wooded area (AGN, *Tierras*, vol. 404, exp. 1). This is a very special case because these were frontier Indians, feared as violent warriors, but the reason they won the case is because their property rights were judged to be above the rights of use of the *hacienda*.

In the second example, in 1723, another pueblo, in the jurisdiction of Celaya, lost its rights of use "from time out of mind" to possession for "a year and a day" by the monastery of Saint Paul (AGN, Tierras, vol. 406, exp. 2, 26 fs.) It can be seen from both these examples that rights of property, proved by titles, began to be given more weight than the rights of use that were recognized by first hand observation and word of mouth. Many reports of litigations testify to changes of land use and of landscapes in this period. The principal change is that crops have invaded wooded areas.

### 2.4. Expansion of haciendas

From the mid 18th century onwards, pressure on the land increased even more. Vague boundaries propitiated the loss of land, or at least the invasion of woodlands. Conflicts between *pueblos* and *haciendas* increased in number. And groups of Indians, inhabitants of the woodlands, suddenly appeared as plaintiffs. For example in 1776, in the mining district of Guanajuato, 292 Indians, nearly all of them woodcutting men or charcoal makers had associated to fight against the *hacienda* owners of the jurisdiction who were denying them access to the woods (AGN, *Tierras*, vol. 800, exp. 1, fs. 28-29v.) Here again property rights were given more weight than rights of use in the exploitation of the woodlands.

Thus rights of use were clearly subordinated to property rights at this time. Rights to the common use of pasture were suppressed and in 1756 the rights to use wooded areas were reduced to the meeting of personal needs only, such as cooking and heating and building for the family –excluding the sale of any excess– (Recopilación de leyes de los reynos de las Indias, Acordado, May 22, 1756). In 1813 the principle of common use of woodlands was completely abolished (Recopilación de leyes de los reynos de las Indias, Decreto, January 4th 1813).

## 3. Conclusions

A study of the conflicts recorded in these documents allows us to appreciate the effects of changing uses of the woodlands during the colonial period. During the three centuries covered, these places were perceived by the inhabitants of cities and *villas*, Indians, *hacendados* and cattle owners, as reserves of land and resources. The superimposition of rights of use over property rights during virtually the whole period meant that there was now no restriction on who might enter these areas. Though the metropolitan and viceregal authorities tried to curb overexploitation and compel the inhabitants to respect the conservation laws, local authorities, who were in charge of applying the laws, were too far away from the central powers, and for the most stayed close to the rich and powerful *hacendados* where they themselves lived.

### Acknowledgement

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## Current status and problems with traditional forest-related knowledge in Russia

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### Abstract

Russia's history demonstrates that Traditional Forest-Related Knowledge (TFRK) has been one of the most important elements of indigenous peoples' livelihoods. In total there are 45 ethnic groups of indigenous peoples in the Russian Federation, of which 37 live in the Arctic Territories and the Far East of Russia. Indigenous ethnic communities are reported to total about 200 thousand people. Traditional economic activities pursued by the northern indigenous ethnic communities during the Soviet times were appropriately supported by the central government. However, over the past five years remote settlements in many Siberian regions have not been adequately provisioned for the long winter months as promised. Russia's contemporary development poses many legislative, ethnic, economic, social, and environmental problems for TFRK. Extensive exploitation of the national forests initiated by the state in the XIX century have dramatically deteriorated forest quality, upset the balance of forest species, decreased the old forest area, and damaged forest biodiversity. Siberian and Russian Far Eastern territories have suffered the most; these are also the areas with the greatest concentration of land use practices based on traditional knowledge. Scientists also emphasize the historical integrity of traditional knowledge practices based on environmental protection and the sustainable use of natural resources – an idea that correlates directly with the basic concepts of the Convention on Biological Diversity. However, so far the Russian government has failed to provide the special conditions needed for implementation. To protect TFRK in Russia it is necessary to develop a special strategic programme aimed at the sustainable use and protection of forests and all natural resources. Programme implementation should be systematically monitored and controlled. Also authors developed and proposed recommendations for authorities of different levels to ensure continued progress.

### 1. Introduction

The national state forests of the Russian Federation (RF) cover nearly 1,114,000,000 hectares, or 70%, of the national territory, and include forests of different types. The extent of the forest cover, constituting around 22% of the world's total forested area, has ensured that Russia is the world's most forested country. It also hosts 26% of the world's intact forest ecosystems – more than any other region of the world.

Russia's history demonstrates that traditional knowledge has been one of the most important elements of indigenous peoples' livelihoods. Traditional knowledge is concentrated mostly in Russia's Arctic territories, Siberia, and the Russian Far East. For example, the main practices of the Northern indigenous peoples, which are based on traditional knowledge, are reindeer breeding, hunting, fishing, harvesting of native plants and herbs, and feedstock gathering.

In total there are 45 ethnic groups of indigenous peoples in the Russian Federation, of which 37 live in the Arctic Territories and the Far East of Russia. Indigenous ethnic communities are reported to total about 200 thousand people. The nomadic and semi-nomadic population in the Russian Far

East, Siberia, and the North (reindeer-breeders, fishermen and hunters) need special support from the government to survive. Traditional economic activities pursued by the northern indigenous ethnic communities during Soviet times were appropriately supported by the central government. However, over the past five years remote settlements in many Siberian regions have not been adequately provisioned for the long winter months as promised.

## 2. Research and Discussion

Russia's contemporary development poses many legislative, ethnic, economic, social, and environmental problems for Traditional Forest-Related Knowledge (TFRK). Extensive exploitation of the national forests initiated by the state in the XIX century, together with unfavourable natural conditions and anthropogenic trends (post-fire forest dynamics, shrinkage of pine forests, decrease of ecosystem ecological functions) have dramatically deteriorated forest quality, upset the balance of forest species, decreased the old forest area, and damaged forest biodiversity. Siberian and Russian Far Eastern territories have suffered the most; these are also the areas with the greatest concentration of land use practices based on traditional knowledge.

There is an additional reason for legislative support of traditional knowledge. According to the proposed forest legislation, all economic aspects of the use, conservation, protection and reproduction of the national state forests will be in hands of business entities on a competitive basis. However, both national and international experience proves the fact that it is impossible to succeed in sustainable community-oriented forest management by prioritising free market mechanisms. If free-market relationships are used in forest management, the norms and measures for environmental protection, as well as the enforcement procedures for preserving traditional uses of nature on indigenous peoples' territories will need to be thoroughly reviewed.

In order to foster and promote the participation of indigenous peoples in sustainable forest management, the government could attract their representatives to participate in the implementation of environmental programs, environmental legislation on enforcement, and environmental impact assessment; submit restrictions on non-traditional practices for their approval, and so on. Obviously, all the norms concerning environmental protection that regulate the activities of indigenous peoples and their communities should be specified in the legislation which determine the legal regime of the Territories for Traditional Use of Nature.

The concept of a "Territory for Traditional Use of Nature" (TTUN) may help to evaluate the federal government's performance with respect to international legislation related to TFRK, and especially to appropriate IPF/IFF Proposals for Action and the CBD. In doing so, it should be noted that so far no effort has been made by the Russian government to provide official information on TFRK. The only report addressing this issue was prepared by the Russian Association of Indigenous Peoples of The North (RAIPON) in 2003, based on a questionnaire concerning the implementation of article 8j of the CBD.

Every country attempts to adjust its legislation on traditional knowledge, innovations and practices to its national interests. So far, no common approach or norms have been developed on the use of traditional knowledge and the protection of indigenous peoples' intellectual property rights (IPR). Table 1 outlines some key current issues and measures to address these issues in the context of IPR and TFRK in the Russian Federation.

Table 1. Key issues and measures needed for IPR and TFRK in the RF

| | |
|---|---|
| Licensing | A licensee should pay a licensor (non-profit organization, community, individual, or representative organ) every time traditional knowledge is used for profit. However, unlike the industrial sector, indigenous peoples' communities, as traditional knowledge holders and users, are not granted the title of individuals or legal entities to that knowledge. Nonetheless, they do have the right to prevent commercial use of traditional knowledge where there is inadequate payment or compensation. |
| Preventing unfair competition | It is necessary to adopt legislative measures that prohibit the marketing of traditional knowledge without the free and prior informed consent of holders of this knowledge. |
| Preventing unfair profit-making | If an individual or legal entity gains an unfairly large share of profits at the expense of a partner / partners, the former should compensate the losses suffered by the latter. |

There are also problems in the practical application of a control system aimed at fair and equitable sharing of benefits derived from the use of communal intellectual property. The main challenges are (i) determining community boundaries and membership; (ii) developing a system to control the use of TFRK, and (iii) defining court examination procedures.

RAIPON and members of regional associations of indigenous peoples of the Russian Far East are trying to meet these challenges by suggesting amendments to the existing laws on traditional knowledge and elaborating new legislative measures. On August 20, 2003 a new law on TTUNs was submitted to the Legal Administrative Department of the President of the RF. The draft was assessed negatively and was sent for revision. During 2003 – 2005 it was discussed and amended by the indigenous peoples' representatives in various regions of Russia. The essence of the indigenous peoples' suggestion is to secure indigenous communities' rights to TTUNs (such as for hunting, reindeer-breeding, fishing).

All studies on traditional knowledge emphasize its interrelation with the environment, as well as its capacity to adjust to changing conditions. Scientists also emphasize the historical integrity of traditional knowledge practices based on environmental protection and the sustainable use of natural resources – an idea that correlates directly with the basic concepts of the Convention on Biological Diversity. However, so far the RF government has failed to provide the special conditions needed for implementation, as illustrated by the following case study.

Kamchatka Peninsula (in the extreme east of Russia, on the boundary between the forest zone and the tundra) is the territory traditionally used by indigenous peoples for river salmon fishing. Forests on the riverbanks influence the hydrology of the river, which in its turn influences the security of salmon breeding grounds, and therefore, salmon spawning. No fish means no food for the Koryak and Itelmen peoples in autumn, winter and spring. However, though asked to nominate Kamchatka Peninsula as a TTUN, the Russian government has not officially granted this status yet. The lack of priority rights for the indigenous peoples in the existing Federal Law on TTUN has resulted in the leasing and selling of these territories to legal entities dealing with commercial fishing.

In Khanty-Mansiisky national okrug (region) there is legislation about family territories, but it does not work in practise. Indigenous people can not make documents to get forests for traditional use. But oil and gas companies can easily make documents for mining even in traditional territories. Such way companies become real masters of indigenous lands. Khanty, mansi and other indigenous people of Siberia live in the forest. They collect berries, mushrooms, pine nuts and other food and medicines from the forest. They use only deadwood for fuel. But many logging companies easily make documents for clear cutting in traditional forests including sacred places of indigenous peoples. After felling thousands of hectares of natural forest disappears and logging sites turn into bogs and swamps.

In order to address problems and conflicts connected with the protection of indigenous peoples' traditional knowledge, the federal government must update and expand legislation and procedures related to traditional knowledge practices and to territories for traditional use.

The Danish Environmental Protection Agency has financed research on "The Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic: A Case Study in Northern Russia". This research has covered the territory of Yamalo-Nenets autonomous area in the Western Siberia and Koryak autonomous region in the Russian Far East. The researchers interviewed 66 reindeer breeders, fishermen and hunters, and documented 263 sacred sites. However, not a single site has been granted the status of a "sacred site" – a new official status providing conditions for effective traditional knowledge protection. To preserve and protect these sacred sites, appropriate laws must be developed and approved at the federal, regional and local levels.

Elaboration of new laws should be accompanied by the encouragement of indigenous peoples' active participation in the protection of their traditional lands, knowledge, and livelihoods. One of the critical issues in the conservation and sustainable use of forests is efficient information exchange and coordination of activities between all the parties involved. This will require the development of a complex information system joining together traditional knowledge holders and users (communities and individuals); a new system of biodiversity monitoring, and the participation of indigenous peoples' representatives.

The most difficult stage in this process is to organize effective cooperation between forest resource users and the authorities – federal and territorial administrations – as well as between commercial bodies and non-commercial environmental organizations. Nevertheless, this dialogue is possible if there is joint organization and exchange of information, and monitoring by the state together with all interested parties.

Information exchange has been developed at the federal government level within the framework of the national program "Electronic Russia". The Plan for the Conservation of Biodiversity and Sustainable Development of the Bikin River Basin (Primorsky Region) was the first and the only international project developed and implemented during the last decade. Regional experts in Khabarovsky Region have developed projects for forest administration and management, allocated hunting territories, and came up with recommendations for effective systems of sustainable social and economic development of local communities. Now they work on small business projects within the joint Russian – Canadian Gassinski Model Forest Project, over a territory of 384,500 hectares. Maps of the protected territories and plans for the conservation of biodiversity in rivers key for spawning have been developed for the Kamchatka Region. Nevertheless, there are few (if any) regional programmes aimed at the conservation of forest ecosystem biodiversity. The only example is the inter-regional strategy of Primorsky and Khabarovsky regions ("On Biodiversity Protection of Sikhote-Alin Mountains"), which stipulates the need to establish "territories for traditional use of nature".

Indigenous peoples' representatives are participating in the implementation of the project "Education Systems as Instruments for Indigenous Peoples' Sustainable Development" Educational information systems for indigenous peoples, and a special youth portal of the Association of Indigenous Peoples of the RFE, also aim to facilitate activities on environmental protection.

Traditional forest-related knowledge and practices of indigenous peoples, if used more actively in forest management at the local and regional levels, could stimulate greater sustainable use and conservation of forest biodiversity. However, the Constitution of the RF allows different forms of forest ownership, and the government is trying to use this fact to speed up the country's economic development. To meet the needs of the private sector, the government provides it with almost absolute freedom to exploit national forests on a payment basis, i.e. to use them through leasing and concession agreements or through short-term contracts. These practices may become dangerous rather than beneficial for indigenous peoples.

One problem with implementation stems from the declarative character of the Federal Law Guaranteeing Indigenous Peoples' Rights in the Russian Federation adopted in April 30, 1999. In many cases the Law does not offer mechanisms to enforce indigenous rights – such as the right to traditional knowledge – but only gives a statement of principles. Therefore, these rights, though guaranteed in the law, are not enforced.

Secondly, conflicts between the authorities of indigenous peoples and government bodies frequently means that no legal regime can be established to guarantee indigenous peoples' rights and protect their interests. In addition, the functions of authorities of federal, regional, sub-regional and local administrations are often duplicated. Also, new legislative measures on indigenous peoples' rights often guarantee rights that are already guaranteed as common rights to all Russian citizens. Thus, given the fact that indigenous peoples are citizens of the Russian Federation, the reason for specifying these rights in new documents is not clear.

## 3. Conclusion

So far the problems mentioned have not been solved; the proposed changes to the existing laws and acts are not effective. In fact, the federal government has not yet succeeded either in the development of a clear national policy. The following recommendations suggest measures that should be taken to ensure continued progress.

- New federal legislation on traditional knowledge and the practices of indigenous peoples should clearly define the legal status of TTUNs, determine and differentiate the jurisdiction of federal, regional, and local administrations of the territories, eliminate its excessively directive character, and address gaps and contradictions in the current federal acts and laws.
- Elaboration of new laws should be accompanied by encouragement of indigenous peoples' active participation in the protection of their traditional lands, knowledge, and lifestyles. One of the critical issues in the conservation and sustainable use of forests is efficient information exchange and coordination of activities between all the parties involved. This will require the development of a complex information system bringing together traditional knowledge holders and users (communities and individuals); a new system of biodiversity monitoring, and the participation of indigenous peoples' representatives.
- The concept of indigenous peoples and their rights should be clarified, and the relevant federal authorities should be specified.
- Regional, and local administrations should take responsibility for providing social and economic support for indigenous peoples, their representatives, and associations.
- Current legislation on local self-governance does not deal with the protection of indigenous peoples' rights. Therefore, to guarantee the protection of these rights, the federal government should delegate authority to local administrations or, if the necessary resources are available, such authority should be accepted by them voluntarily.
- ILO Convention 169 on Indigenous and Tribal Peoples should be ratified as soon as possible, to inspire the further development of the RF legislation on traditional knowledge and practices.

- To protect TFRK in Russia it is necessary to develop a special strategic programme aimed at the sustainable use and protection of forests and all natural resources on TTUNs. Programme implementation should be systematically monitored and controlled. The programme should deal with the following issues:
  - clear definition of the legal regime for the use of land and nature by indigenous peoples, and restrictions on the use of TTUNs by government and private businesses.
  - definition of the terms under which subsoil resources can be exploited in the TTUNs. This could be done by a special federal commission appointed by the federal government, in agreement with the local authorities. The commission should represent federal structures dealing with the social and economic development of the RF Northern territories and local administrations.
  - The new Federal Law on TTUNs (following the Federal Law Guaranteeing Indigenous Peoples' Rights) should aim to secure indigenous peoples' rights to establish, protect and utilize TTUNs in the Northern and Far Eastern territories of the RF.
  - Procedures for dispute arbitration on the use of natural resources in TTUNs should be developed.
  - Land tenure and rights to nature should be specified for different categories of indigenous users (hunters, fishermen, etc.).
  - Indigenous peoples have no reliable, trustworthy documentary historical evidence which can be used to prove their rights to the lands and properties, and therefore, to their traditional knowledge. The on-going process of formulating these rights must consider both national and international experiences.

# Conflicts between traditional knowledge and official applications on sustainable forest management: a case from Turkey

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## Abstract

The Turkish Republic was established on a land used by many civilizations for many years. Effects or traces of the management regimes of these civilizations can be found in the present values and beliefs of the society. The Ottoman Empire's constitution was based on interpretations of Islamic rules, so forests and wild animals were defined as gifts from God to mankind. As a result of this approach, people ruled by the Ottoman Empire for approximately 600 years freely benefited from forests. After the Ottoman Empire, the Turkish Republic adopted secular rules. The first forest law was passed by the parliament in 1937. In the same year, the General Directorate of Forestry was established for the management of state forest lands and to control all forest possesions in the country. The Turkish Republic approved forest ownership if there was a title deed or official documents could prove ownership rights for a forest. Cutting, grazing, hunting, collecting and settlements in forests were prohibited by the State. In this study, the origins of the differences in the understanding of the people and governmental organisations towards forests in Turkey are discussed. Conflicts and crimes in forestry, arising from differences in understanding between traditional and official ownership in Anatolia, are discussed with reference to timber production, wildlife, non-wood forest products and grazing using statistical data on different forest crimes. Finally, measures that have been taken or might be taken by the public organisations to change the understanding of the people regarding forest resources and their sustainable management are discussed.

**Keywords:** forest ownership, Ottoman Empire, forestry and beliefs.

## 1. Introduction

The geography of the Turkish Forestry is one of the places where the first signs of the human being were seen. Caves of Karain, Beldibi and Belbaşı around the province of Antalya are the caves were used by men at the time of Palaeolithic age (Akurgal 1997) People during this era made their living by hunting and picking up wild plants of forest. Today, five of the ruins (Çayönü, Çatalhöyük, Hacılar, Norşuntepe, Köşk Höyük) which are accepted as the civilization residentials are located in Anatolia (Akurgal 1997).

The history of Anatolia can be considered a history of civilizations which advanced and varied throughout the period of 10.000 years. The civilization of Troy, known all over the world, is only one of the first civilizations in Anatolia. Knowledge of the Hattic, Hurrian and Hittite civilizations is also needed to understand the evolution of Anatolian culture. The Hittites called the Hurrian civilization as "The Land of Cedar" (Akurgal 1997).

These civilizations are known to have used nature and were affected by it. There is written evidence showing the existence of animal parks in Kültepe, 1800-1700 B.C. and that the merchants of Assyr-

ian imported wood from Anatolia between 2100 – 1700 B.C. and that the Hittites made regulations related to the measures of wooden that would be used in palace (Alp 2000, Çığ 2000). The Epic of Gilgamesh demonstrated that forests in Anatolia were used throughout the region (Perlin 1989).

After these civilizations, Indo-European people moved into Anatolia, including the Phrygians, Hellenes, Galats and Romans (Akurgal 1997). During these centuries the Turks, who are known as a nomadic society, started to migrate into Anatolia from Central Asia. Interacting with various Islamic groups en route to Anatolia, the experienced a transformation from Shamanism to Islam. Settlement of the Turks to Anatolia was complete with the establishment of the Seljuk State, founded by Seljuk Bey in about the 10$^{th}$ century. Prior to this period, Western Anatolia had been governed by the Byzantines.

The Seljuk State, defeating the Byzantine army at Malazgirt (Manzikert) in 1071, moved westwards and narrowed the geographic influence of the Byzantine. When the Seljuks were defeated following the Mongol invasion, Turcoman groups founded many beyliks. Anatolia was governed by these beyliks concerning Seljuk state structure. The Ottoman State was founded by Osman Bey in 1299. The Ottomans ruled the lands they conquered and took over from the Byzantine and the Seljuk for the next 600 years. Over time this state changed into the Ottoman Empire. During this period, they ruled a field of over 11 million km$^2$.

The defeat in the First World War brought an end to the Ottoman Empire and Turkish Republic was founded in 1920, which included the Anatolian lands. Besides the Republic, new States including 13 on the European lands, 27 in Asia and 5 in Africa were founded in the former land of the Ottoman Empire. Consequently, it isn't surprising that the Ottoman rule had an effect on the public's views and beliefs about laws related to land use. A state causes its own people's customs to occur with arrangements which made towards its desires. So the origin of some customs and beliefs concerning the forest should be linked to their understanding of the States which had ruled these lands.

The Turkish Republic, founded in 1920, is different from the Ottomans with its secularist and republican structure and its perspective on forest law. The aim of this study on forest crime which is an important problem of today's forestry, is to compare the arrangements related to forests in the past and present, and to discuss the ones which transformed into the traditional knowledge within the rule of forest.

## 2. The crimes concerning the rule of forest sources as an index of conflict

Administrators responsible for ruling forest resources have performed legal arrangements related to the topic. The actions against these practices may be turned to 'the stand of crime'. In addition to this, it's possible to think that these crimes resulted from the arrangements are 'the fields of conflicts' between the ones who regulate and the ones who have to obey these regulations. Forest crimes, which arise from these fields of conflict, can be classified in general groups as cutting, spreading and grazing. It was determined number of the annual averages of the crimes for 60 years are 34.115, 10.047 and 4.412 respectively for cutting, spreading and grazing crimes in Turkey (Özdönmez 1965, Çanakçıoğlu 1993, OGM 2006, DPT 2006).

According to Özdönmez (1965), forest crimes are derived from economical, social, cultural, legal, technical, administrative and psychological factors. By explaining these points clearly, Özdönmez consubstantiates the culture with the level of education, but links psychological factors to traditional knowledge. According to Özdönmez (1965), it can be said that some of the historical cus-

toms direct the individuals to violate the laws of forest. In the first periods of the Ottomans, the forests were opened for the usage of people without depending on any registration and reservation. Moreover, according to the Land Act of 1858 and the rules of Mecelle, which was specific legislation and put into practice in 1879, it was accepted and legalized that everyone could cut down the trees as they pleased on The Balkans and in the mountains, which were regarded as an understanding called as *Cibali Mübaha* in Ottoman terminology. *Cibali Mübaha* means that a place or mountain where everybody can benefit or use freely. It wasn't possible to destroy the customs and the habits in public even if the free usage practiced in the past was wanted to be gathered through the following laws and regulations (Özdönmez 1965).

The similar thought has been shared by Çanakçıoğlu. For him, the way of thinking, which is regarded as the natural right to graze animals in forests or to take advantage of the forest by any means is common. That's why it's very hard to save the forest from the teeth of animals (Çanakçıoğlu 1993). This situation is valid for the crimes apart from pasturage. Indeed, the crimes have been perceived with a point of view, which is different from other crimes owing to 'the way of thinking of *Cibali Mübaha* remained from the past' and also this fact has not been evaluated as robbery. (Çanakçıoğlu 1993). In fact, nowadays the Turkish society never tolerates the thieves but on the other hand, they don't react significantly to the people who steal by cutting down the forest. Therefore, for good understanding of the origin of Turkish Republic forestry against to social conflicts, applied management comprehensions through history should be more details examine in this land.

## 3. The forest ownership regimes as a source of conflict

### 3.1. The forest ownership in Anatolia in the periods of the pre-Ottoman Empire

It has been seen that the civilizations during the Ottoman Empire and before they created an ownership system of forest and land under the sway of financial resources and religious beliefs of their own states. Production of agricultural crops having great military importance for these states and procuring of the incomes which were required for the state's expenses caused anxiety for the administrators. In the period of the Hittites, it has been known that the kings gave lands to their aristocrats on the understanding that they could provide necessary guns and mounted war carriages which needed for their armies (Akurgal 1997, Çığ 2000). In this period, it has been estimated that the commerce of forest crops were interested rather than forests and the kings prohibited the export of wood at the time of scarcity and added the wood to the most valuable wares of the public purse (Akurgal 1997, Alp 2000, Perlin 1989). In the Greek and Roman civilizations in Anatolia, Mountains and Olive-trees were blessed, fields of olive were accepted as government-owned, prohibited to be cut down and burned (Estin and Laporte 2002).

It has been seen that the Hittite's understanding of property continued in the periods of the Roman, Byzantine and even the Seljuk. States needed incomes. On the other hand, they tried to prevent to become the owners of large lands. So, especially the agricultural territories were added to the government-owned. After all it has been known that the Byzantines saved property right for the unused territories but entitled some rights to the peasants and monasteries on usage of these lands to stimulate the economy (İnalcık 2000). The agricultural lands being expanded against forests were not accepted as a hazard in order to increase agricultural production and raise public revenues.

The land regime of the Seljuk state, as well as being affected by the institutions that belong to the Mongols and Byzantines, was a synthesis of the Turkish social organization and Islamic land system (Sencer 1968). The Seljuk State expanding with new conquests made the ownership of

the lands which captured according as the Turkish culture and the regulations concerning conquest in Islam. Nizam ül Mülk who was the known as the most famous vizier of the Seljuk, by taking account of techniques of the Romans and Islamic Law, created a comprehensive regime of land ownership.

Nizam ül Mülk divided the lands of the State into the three parts called *Has, Ikta* and *Haraci*. Has lands were accepted as personal property of the Sultan. Lands of Ikta, like the ones, which the Hittites gave their aristocrats, has been evaluated as public lands being assigned to private usage on the condition that its freehold is in the state, in exchange for military services. Lands of Haraci consist of public lands, assigned for the non-Muslims to tame on the understanding that they pay tax. Thus, the state used to obtain taxation incomes, the army was interested in land but becoming an alternative power of landowners against the family of the Sultan was prevented (Sencer 1968). No records related to forests of that time are known. In other words, especially in the periods of Byzantine and Seljuk, it has been thought that forests were assets which were benefited freely in point of cutting down trees, grazing and hunting.

## 3.2. The understanding of ownership during the Ottoman period

The legislation on benefiting from forests of the Ottoman State should be examined in two different periods concerning an important act of 1870 called as a regulation in Turkish '*Orman Nizamnamesi*' but designed as an act.

### 3.2.1 Prior to the Forest Act of 1870

The Ottomans' land and forest regime was very similar to that of the preceding civilizations. The administrators of the Ottoman State, like the previous ones, also wanted to create an economical system which could not constitute a rival against the family of Ottoman family and will be able to provide for the needs of its army and unsure of its incomes (İnalcık 2000).

Therefore, the Ottomans established the regimes of land management on "the state ownership". In addition to this, they did not transform the state into an entrepreneur for a land and left the right and duty to process the land to the peasants called "reaya". The kinds of ownership appeared as a result of The Law Of Ottoman's Land has been defined in the Table 1. As seen in Table 1, Land classes consist of Miri, Mülk, Foundation and Mevat lands.

The lands figured as Mevat Lands on the Table 1 were accepted as dead soil, not doing farming and, despite being in public ownership those lands were free for the people who wanted to hunt, graze, cut trees, and open to agriculture. With the prophet's statement *"All the deserted, bare, no tamed and harvested lands are The Allah's and His prophet's"* the administrators of the Ottomans were accepting the fact that such lands were in government-owned (İnalcık 2000). Consequently, in respect of the Ottomans' law of land, the forests at the characteristic of mevat land but they were the government-owned lands. Due to fact that using these fields was free, the forests were being seen as 'cibali mübaha' lands.

The people who transform any Çorak Mülk to agricultural land could be the owner of this land. This kind of transformation was defined as inhabited lands and supported by state to encourage economy and revenues of taxation. Today, some forests in Turkey which we regard as "private forest" are probably the places which were transformed into private belongings by

being opened to the agriculture and then were transformed into the forest again when the agriculture were abandoned while they were "Mevat" lands in the past. That's why it can be said that today's Turkey contained much less private ownership of forest than the Ottoman's.

Table 1. Kinds of land possession in the Ottoman period (İnalcık, 2000)

| Land Classifications | | Description |
|---|---|---|
| 1. | Miri lands | These are the lands, which belong to the state and are banned to be sold, to be mortgaged, to be donated and to be handed over by the people who are given the right of usage. |
| a. | Miri lands with a deed | These are the state lands, which were given to only the reaya with a pact of deed and in which the rights, which take place due to the pact of deed can be handed over. |
| b. | Lands with Mukataa | The state land the usage right of which is given by a common loan pact to the people who needn't to be a peasant. |
| 2. | Mülk lands | The lands, where the right of private possession is given. |
| a. | Temlik mülk lands | The lands, which the Sultan gives to a private person among the state lands on condition that the right of possession must be protected. |
| b. | Çorak mülk lands | The lands where the right of possession is given to a person who improve it for agricultural aims. |
| c. | Mülk lands with selling | Privates lands which are bought with a selling process suitable to the Islamic law. |
| d. | Old mülk lands | The lands, which belong to the groups of executive people who have the right of possession before conquest and which are given the right of possession by the approval of the Sultan. |
| 3. | Foundation lands | The lands, which are donated to a foundation whereas they are private possession. |
| 4. | Mevat lands | The wastelands, which are never cultivated before such as uncultivated forests, deserts or marshes. |

The Ottomans wanted to keep the land system created by them. Land system was controlled by central governments and was dependent upon the provincial cadastral surveys. These surveys, known as *tahrirs*, were an essential instrument of administration. It has been understood from the tahrir books, which has remained up to now that the right to use every land was observed, the population on these lands followed, and the rights of ownership were updated by checking again upon changing every Sultan (İnalcık 2000). In spite of this, the Ottomans were not interested in forests during the long period owing to that multiplicity of forestland, poor of population, created no danger on the supply and demand of forest crops. But, when especially shipyard and the needs of it were on the carpet, the state enacted special orders about some forests and places. As far as understood from these orders, some of the parts of the forests were separated in order to satisfy the needs of shipyard and it was banned to cut lime trees which were required producing rope (İstanbullu 1978, Bingöl 1990).

In 1858, The Ottomans enacted a law of land but they didn't alter their point of view of forests. For the 19$^{th}$ article of law of land, the people who save up the lands like forest and oak coppices by private deed are able to convert these places into fields. In the 104$^{th}$ article of the same law, every one can provide wood and timber from forests regarding to Cibali mübaha approach. The tax can't be acquired because of this using but these places can't be performed as an individual subject (Gümüş 2004).

According to Istanbullu (1978) forests could be classified in eight classes such as forests allocated for shipyards and gun facilities, Hassa Woodlands, Miri Woodlands, Miri Forests with deed and Mukataa, Forests owned by villages, Forests allocated for cibali mübaha, Mülk Forests and Foundation forests for the period before Forest Act of 1870 and concerning related legislation in Ottomans (İstanbullu 1978).

### 3.2.2. After the Forest Act of 1870

In the 1800s, The Ottoman experienced some structural changes considering financial troubles in it and difficulties in course of time. In 1839, an administration of forestry was founded. In 1857, a school of forestry was opened. Another change was an Act on forestry published in 1870. As regards comprehension, the first important document is the Forest Act of 1870 at the level of law (Gümüş 2004).

The Forest Act of 1870 faced with public reaction before being published. A new administration of forestry and the School of Forestry being opened, issuing of variety orders about forests caused the rumours of that using it freely would be removed spread out among the people and they gave harm to the forest (Bingöl 1990). In the Forest Act of 1870, the forests are classified as The Forests owned by State, Forests of Foundations, Forests owned by Towns and Villages and Private Forests within ownership regime. The Forest Act of 1870 accepted the forests excluding the forests belong to individuals, town and villages, foundations as public forestry and reformed greatly by removing legally using these forests freely (İstanbullu 1978, Gümüş 2004).

What's more, In the Ottoman period, the order of ownership in the field lands in addition to the forests was a problem between the people and the state. Although the villager had to get permission from the Sultan, they cultivated the fields without taking any permission from the administration based on the fact that the lands belonged to them. Especially it was seen that peasants stood insistently against the official administrators, who wanted to rent the Miri lands with Mukataa (İnalcık 2000). This situation was available for the forests too. The peasants thought that the parts of forests, which they claimed to protect by preventing others from using, were their own property. Indeed, the traditional-used borders in forests had been occurred and the land of actual used had been extended without breaking the borders by others. However, the distribution according to the official ownership figures of forestry between 1870 and 1937 are like in Table 2. The columns related to the areas computed from different inventories. It has been seen that the forests are in the state's ownership in general. Consequently, although there are people who claim that they are the owners of the forests, which are situated in almost every part of the country, the level of the forest, which belongs to a private person legally consists of only 4.7 % of the all the forests.

Table 2. Distribution of forest possession among 1870-1937 (İstanbullu 1978)

| Possession forms | Area (Ha) | Area (%) |
|---|---|---|
| State forests | 7.120.492 | 91,74336 |
| Foundation forests | 92.446 | 1,191116 |
| Village and town forests | 89.737 | 1,156212 |
| Private forests | **365.522** | **4,709534** |
| Unknown possession | 93.118 | 1,199771 |
| **Total** | **7.761.315** | **100** |

Table 3. Distribution of forest possession in Turkey in 2004

| Forest | Number | Area (Ha) | Area (%) |
|---|---|---|---|
| State forests | ? | 20 763 248 | 99,93 |
| Public forests | 49 | 3 959,4641 | 0,019 |
| Private forests | 284 | 11 544,3011 | 0,056 |
| **Total** | **333** | **20 778751,77** | **100** |

### 3.3. Forest ownership and policies since establishment of the Turkish Republic

The time of Republic differs greatly from Ottomans and preceding civilizations from the points of view of structure of the state and also understanding of the forestry. Turkish Republic, founded in 1920, abolished the dynasty, brought an end to the caliphate and accepted the secularism. As a result, there wasn't a Sultan in the state. The laws of the new state didn't form according to any religious belief. These acceptances conflicted with almost each justification based on the land law of the Ottomans.

The Turkish Republic not only handed over the loans of the Ottomans but it also handed over the rights of them. The properties of the Ottoman State became the properties of the Republic. The Republic couldn't make comprehensive regulations related to the forestry in the early years of its foundation but in 1937, it passed the first Forest Law numbered with 3116 and found a general directorate, which was responsible for the managing of the forests owned by state and controlling of other forests. According to Forest Law 3116, there are a) state forests, b) forests owned by villages, towns and municipalities c) foundation forests d) private forests in the country. As seen from classification, the first forest law of the new state accepts all of the forests, which existed in the Ottoman time. Their forests were given to those who had the certificate of the ownership. But all of the other forests, owners could not proved with an official evidence, were accepted as the state forests. After that, there were serious conflictions between the people and the state foundations about where the state forests were. The people thought that the forests, which they had been using freely and had regarded as their forests but defined as "mülk land" according to the classification of Ottoman, were seized or nationalized by the state. The most important reason of this confliction is the belief of benefiting freely from the forests that has led the people's practices and become a traditional knowledge for centuries. The difference between the possession design of people and Ottoman lawyers has revealed and conflicted at the time of the establishment of the Turkish Republic.

Moreover, some parts of forests which became private forest by gaining the name of "mülk land" in Ottoman time was also nationalised by the Forest Act of 3116 regarding their size and distances from the state forests. In all, 33.804 ha and 28 private forests were nationalised by paying 349.730 TL. (İstanbullu 1978). This application strengthened the belief on a nationalization of the forests, which were owned and benefited freely by people.

After the Act of 3116, a group of forests appeared whose owner wasn't known and which caused problems for the forestry. Under the global trend of nationalization in 1940s and the belief that state would process the activities of the forestry better, a new forestry act of 4785 prepared by the government in 1945 to solve ownership conflicts. With the act of 4785, 156 forests (totally 204.764 ha.) were nationalised by paying 4.007.038 TL. (İstanbullu 1978). However, The Forest Act of 5653 in 1950 decreased the number of the classes of possessions in forests. It added the foundation forests, which existed in previous laws to the village and town forests. What is more, the real big change was performed with another forest act of 5658 passed in the same year. The Act of 5658 expressed that the forests seized by state according to act of 4785 could be given back to the owners who are apply regarding the method defined in the act of 5658. Consequently, 34 forests (13.457 ha.) were given back to former owners according to rules in Act of 5658. Distribution of forest possession regarding present ownership classes and situation can be seen in Table 3.

## 4. Wildlife and non-timber forest crops as a source of conflict

Despite official understanding that issues related to wildlife and hunting, grazing and non-wood forest products in agricultural areas were no different from the forests in the Ottoman time, the Turkish Republic put an end to the system of "using it freely" in these areas. Consequently this situation has caused conflict between forest administration and villagers since Turkish Republic founded, and is a primary reason for forest crimes in Turkey.

## 5. Conclusion and suggestions

The total number of the forests, nationalised in 1937 and 1945, and given back to owners in 1956, is 225.110 ha. the distribution in Table 3 isn't the result of the policy of nationalisation of TR. Although the number of the nationalized forests is only a portion of 1% of all forests, many people believed that their forest were seized by state Turkish Republic era. This belief was supported and used by politicians during the transition process to democracy to gain votes. Many Turkish foresters presently believe that uncompleted cadastre activities are the main source of the many forestry problems. Naturally, They view the activities such as defining the forest, not changing the definitions very often, increasing the number of the staff in charge of making cadastre and developing their technical opportunities as the solution.

But during the historical period it has been proved that the people who believe that "the forest were taken from them" won't think that the work has been finished even if the cadastre of all the forests are made by these opportunities are fulfilled. For that reason, an idea-marketing programme on differences between TR and Ottoman land regimes must be conducted by General Directorate of Forestry in national level to constitute a public awareness and to change traditional knowledge.

In the short history of Turkish regular forestry, it is also possible to see examples on the regulations prepared by concerning traditional knowledge successfully. According to article 40 of the Forest Act, forest workers must be employed from the villages near or in the forest. This rule that agreed with traditional knowledge of the forest villagers is applied since 1937. The article derivates from a tradition have been used as an important mean in the solution of the social conflicts. Turkish experience with successful and failure examples on forest ownership, grazing, wildlife and non-wood forest products prove that traditional knowledge and beliefs must be considered as an important variable in planning and managing of the forests and as a source of the conflicts between people and official responsible related forests.

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# It all began with Adam
# The historical roots of the conflicts between conventional resource management and traditional local communities

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## Abstract

Conflicts are one of the possible outcomes of projects carried out by international organizations, governments, etc. in order to improve forest management in developing countries. Natural resources in these countries are frequently perceived by project technicians as degraded because of what seems to be traditional "anarchic and destructive" practices of peasants. The traditional forest-related knowledge of local communities is disregarded and the access of these communities to natural resources is limited. As part of the reform package more management and intervention measures are proposed to replace those traditional practices. Consequently, conflicts arise. Similar conflicts between centralized forest administrations and peasants have been frequent in European history during the last three hundred years. This paper aims at understanding current conflicts in developing countries by exploring the relationships between conventional resource management and traditional local communities in European history. We suggest that the addressed conflicts might originally have arisen in the wake of the competition between the emerging mercantile society (capitalism) and the peasants' communities in Europe from the end of the 17th century on. Intellectuals of the Scottish Enlightenment School (Adam Smith was the most important of those intellectuals) whose essays reflected the ideology of the new social group (bourgeoisie), would have strongly contributed to introduce into the academic world the arguments used by this group for defending their interests. Our paper emphasizes the *ecological* and *living fossil* character that these ideas reveal.

## 1. Introduction: let's talk about conflicts

One of the authors recently attended a seminar on biodiversity organized by the prestigious Chatham House in London. The goal of this event was to discuss different issues regarding the commitment of parties to the UN Convention on Biological Diversity to achieve a reduction of the rate of biodiversity loss by 2010. During the discussions participants repeatedly referred to the biodiversity projects carried out by the *Global Environmental Facility* (GEF) in developing countries (GEF is a financial organization that funds projects in developing countries that benefit the global environment and promote sustainable development in local communities). The author decided that it was about time to comment that projects carried out by international organizations like the GEF and the World Bank (WB) sometimes have very negative impacts on poor rural communities. The statement was supported by various reports and papers that deal with these conflicts. Participants, except for one, remained silent (probably shocked). The only reacting person argued that the GEF and the WB were the most important institutions funding such projects in developing countries and excitedly refused the critical statement.

Should we avoid to address the problems of very poor people just because these problems are caused by prestigious organizations? We don't think so. Talking with colleagues that have experience in developing countries we have the impression that conflicts with local communities occurring within the frame of international projects might be relatively frequent. It is supposed that peasants and herders in those countries don't manage natural resources appropriately and thus are proposed to replace (to different extent) their traditional activities with more "sound" practices of conventional resource management.

This paper aims at understanding current conflicts in developing countries by exploring the relationships between conventional resource management and traditional local communities in European history. It is suggested that these conflicts have very deep and strong historical roots.

## 2. Conflicts in developing countries

One of the possible outcomes of projects carried out by international organizations, governments, etc., for improving forest management in developing countries is conflicts with local communities (see for example Griffiths, 2005; The Rainforest Foundation, 2005, etc.). Natural resources in these countries are frequently perceived by projects technicians as degraded because of what seems to be "anarchic and destructive" practices of peasants (Bassett et al., 2000; Boerma, 2006). It is worth mentioning that these projects frequently lack baseline surveys that allow an assessment of the effects traditional activities have on ecosystems. In spite of this, the traditional forest-related knowledge of local communities is disregarded and the access of these communities to natural resources is limited. As part of the reform package, more management and intervention measures are proposed (Bassett et al., 2000) to replace those traditional practices. Measures taken include the substitution of the communal use of resources by private ownership as well as voluntary relocations (sometimes involuntary, see for example Griffiths, 2005). Consequently, conflicts arise.

The capitalist model of development is reflected in the reformist and technocentrist character of the science of conventional resource management applied by international organizations (Bassett et al., 2000). In European history similar conflicts (to the ones described above) have frequently occurred between centralized forest administrations and peasants in European history during the last three hundred years. We suggest that the addressed conflicts might originally have arisen in the wake of the competition between the emerging capitalist society and the peasants' communities in Europe from the end of the 17$^{th}$ century on.

## 3. It all began with Adam

The rise to the power of the bourgeoisie (after the liberal revolutions, 17$^{th}$ Century) brought important socio-economic and political changes in Britain. Among others: mercantilization of natural resources, substitution of the peasants' subsistence logic with the maximisation of individual benefit and pre-eminence of private ownership. Two important elements of traditional peasants' societies were their dependence on many different natural resources and a strong mutual cooperation within their communities (Rösener, 1991). Rural households relied principally on agricultural activities. Additionally, they extracted fruits, mushrooms, fodder, fuel wood, timber, etc. from the woodlands. Forests were used as extensive pasture lands (*agrosylvopastoral systems*) too. Besides, reciprocal interdependence played an important role in peasants' every day life. From the peasants' perspective their properties (*common lands*) had been usurped by the bourgeoisie. Thus, disputes among both groups based upon alternative views on ownership rights (Fontana, 1999) as well as upon opposing forms of social organization and management of natural resources. Conflicts between the emerging

capitalist society and rural communities became very frequent and a "police force" was invented in order to protect the new private ownership. Peasants had to experience the extraordinary situation of being penalized just for extracting fuel wood from forests that had been common land until a short time ago.

The concerns of the bourgeoisie were supported by scholars of the Scottish Enlightenment School whose essays reflected the ideology of the new social group (Fontana, 1999). Adam Smith was the most important and influential of these intellectuals. According to the eminent Spanish historian Josep Fontana (1999), Smith's ideas (vehement advocacy of private ownership, mercantilization of natural resources, maximization of work productivity and benefit, etc.) constitute a paradigm of unparalleled success in human history. They are the foundation of modern social sciences and part of popular thinking indeed.

Intellectuals took over and assumed as a fact what the bourgeoisie frequently criticized the peasants for: namely, that the communal use of natural resources carried out by rural communities contributes to the overexploitation and destruction of these resources. During the 18th and 19th centuries, liberal revolutions spread over Europe legitimated by scholars whose ideas were rooted in the Scottish movement. The beliefs of the intellectuals of the Scottish Enlightenment School became part of the vision of the western world and indeed infiltrated academic thinking. These beliefs are the origin of the conviction that local rural communities misuse their natural resources which has been prevailing for a very long time (300 years!).

## 4. Ideas as ecological factors and living fossils

Examples of this expansion and its consequences are provided by the history of forest use and management. In preindustrial Europe wood played an essential role as energy source and construction material and strong interests emerged around forests. Frequently the origin of the discipline of forestry is interpreted as a reaction against wood scarcity. But a historical perspective allows a different view.

The goals of this *new* management model, developed by German economists and forest researchers during the 18th and 19th century, were the quantification and rationalization of forests as well as the achievement of a constant maximised yield of wood production. It emerged together with other sciences of state finances that were required by the improved fiscal administration of the enlightenment era (Ciancio et al., 2000) and was part of general trends towards centralization. With this regard, Christoph Ernst (1998) has written: "Central authorities controlled and managed the system: they thereby replaced regional and local practices".

The argument used by the bourgeoisie in the frame of their conflicts with local rural communities, namely that the last contributed with their traditional activities to the overexploitation of the forests, can already be found in the 18th and 19th century in forestry literature in Germany: "This diversity of utilization by the rural population endangered the forest stand in the eyes of the foresters because –according to the new standards– it was unorganized, unscientific and unsustainable" (Ernst, 1998). Thus, ideas can be considered as ecological factors too (Worster, 1988), since their implementation introduces important changes in ecosystems: "This form of silviculture [...] led first to the abandonment and then the disappearance of traditional, empirical silviculture that had been tested through the years and was linked to the family economies of the rural populations" (Ciancio et al., 2000).

In Spain the intellectuals of the Illustration complained about the degraded stage of forests too. Some of them proposed more state intervention as a possible solution. Others supported the privatization

of common lands (Casals Costa, 1996). The result was the same. Local communities lost their control on natural resources while the bourgeoisie increased their ownership (Cobo Romero et al., 1992).

The ecological character of ideas can be appreciated in the Spanish liberal revolution too. In South-Eastern Spain, for instance, just within the first thirty years of the twentieth century, a reduction of 17% of the forest and pasture surface took place while the agricultural surface expanded by 26% (*agricolization* of the landscape, Cobo Romero et al., 1992).

Astoundingly, 300 years after their emergence, the addressed ideas can still be recognized in today's forestry literature and, correspondingly, can be regarded as *living fossils*. They were broadly accepted by Spanish foresters during the 20th Century (Cruz y Aguilar, 1994) and argued by Germans as well. So, for instance, according to Burschel et al. (1997) traditional tree management (pollarding, shredding, etc.) and forest management (wood pastures, the individual extraction of trees as practiced by peasants over centuries, etc.) have caused considerable damage to the trees and forests. These contemporary authors take over the classical criticism made during the last centuries on rural communities: "In spite of forest prescriptions and regulations, the described careless forest management led to an almost extensive forest devastation. As a consequence forestry emerged in the 18th Century, first as an orderly activity and afterwards as a science" (Burschel et al., 1997, p. 17). This old-fashioned view has a practical side too.

A detailed observation of the traditional management practices of peasants does not allow the claims of the bourgeoisie's discourse. The first impressive aspect of such activities is their long-term character. Tree and forest management (pollarding, coppice, etc.) were probably already practiced during Neolithic times in Central Europe (for example in Austria, Offenberger, 1981; Bortenschlager, 1976). Thus, traditional forest-related knowledge would possess a very long tradition in Europe. Additionally, these practices do not injure trees and stands at all but indeed allow (pollarded and coppiced) trees to achieve considerable ages (several hundred years) (see for example Rackham, 1978). Finally, traditionally managed trees contain respectable amounts of dead wood, contributing to the maintenance of many animal populations that depend on such material (xylobiont beetles, birds breeding in holes, etc.).

The same can not be claimed by "traditional" forestry. Ciancio et al. (2000) have emphasized the double embedding of this discipline: on the one side, the theory of economic development and, on the other, the deterministic predictability of the mechanistic paradigm. Such a background has had negative impacts on natural resources. Our contribution has already addressed some aspects of the influence of Adam Smith's economic development theories. This paradigm features an exclusive character, rejecting any possible alternatives (Fontana, 1999). So traditional practices of resource management were also rejected by the forest administrations that emerged on behalf of the new bourgeoisie governments.

On the other side, the mechanistic approach of classical forestry has contributed to a simplification of ecosystems as well. All around the world foresters searched for order. They disowned the chaotic aspects of deadwood rich forests and demanded to clear it away (see examples in Central Europe in Splechtna, 2001, and in North America in Peterken, 1996 and Langston, 1998; we observed this in Aleppo pine forest in South-Eastern Spain). In Australia foresters concentrated their activities on the scarce tall and medium eucalypt forests (i.e., stands that resembled the ordered "Normalwald" of the classical German authors) while disregarding the low woodlands of little commercial value on steep and stony slopes (Dargavel, 2000). Finally, in some Mediterranean countries they are still opposing traditional activities in the woods (e.g., in Italy, where the forest administration is disapproving controlled burns in chestnut stands, Grove et al., 2001), or are carrying out management practices that simplify forest ecosystems (Palma et al., 2000; Galán et al., 2003).

## 5. Conclusions: readapting to new environments

Almost thirty years ago, the well-known anthropologist Maurice Godelier (1980) wrote: "It is necessary to carefully analyse the constructed perception of the environment of a society, since this is the basis on which the group manages natural resources [...] Development programmes that do not take into account the representational system of traditional societies with regard to their environment are exposed to failure as exemplified by many failed projects in developing countries".

It is incredible that such evident principles are still being ignored. One of the reasons might be the firm embedding of the ideological frame in the western world which is characteristic for the historical conflicts described in this paper.

The beliefs of the Scottish Enlightenment intellectuals became part of the vision of the western world and indeed infiltrated academic science. They have survived three hundred years and are still alive, like living fossils readapting to new environmental conditions. Nowadays they might legitimate, in the name of science, interventions in rural land-rights systems in developing countries and serve the interests of governments and development-aid organizations (Basset et al., 2000), with tragic consequences for the poorest people.

This paper shows that the preconceived view according to which traditional forest (and other natural resource) management systems are unsustainable and destructive does not have its roots in the conflict between conventional resource science and old practices, but in the conflict between different economic, social and political interests and their corresponding ideologies. Consequently, the arguments of the involved parties reveal a variable proportion of subjectivity. Therefore, in the frame of environmental planning and policy making projects, traditional forest-related knowledge should not automatically be disregarded. On the contrary, this knowledge and its practitioners must be actively taken into account from the very beginning on.

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## Evolution of the forest landscapes and tribal practices, a case study of forest management and its impacts in southern India

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### Abstract

Local communities are central stakeholders in the management of agro-ecosystems and first concerned by the debates on forest management, sustainable development and poverty alleviation. These communities, for a long time kept aside from the process of decision making regarding the management of forest areas, are now considered to be essential partners. But at the time when participatory forest management programs are implemented in several places in the world, the exclusion of local communities is still prevalent in many places in India. In this country where the human societies are very old and where the densities of population are high, the colonial administration delimited protected areas from which people were excluded, except the tribal populations. The management of these areas, whose limits correspond to this colonial heritage, is placed under the only responsibility of the forest administration. In India, each State has its own forest administration and decides the way of implementing the forest policy issued by the Central Government. For some people, forest and its biodiversity can be preserved only in protected areas free from any human intervention. Others, on the contrary, militate for recognition of the local knowledge for the forest management. Indian Forest Departments currently face many difficulties in setting up participative forest management. One of the current stakes for the forest management in India is thus the redefinition of the relations between the administration and the local populations. In this context, this paper will focus on the impacts of the tribal population (through their practices), and the forest authorities (through their management) on the forest landscapes and their changes in the Southern Indian State of Kerala.

In the South of India, the forests covering the Western Ghats are source of a very important endemic biodiversity, representing a high economic and ecological potential. In the small and mountainous State of Kerala, located at the South-West of the Indian peninsula, the forest lands still officially cover more than 28% of the State. But these forests are mainly forest plantations, often monospecific and it is estimated that the non degraded forests currently cover less than 10% of the area of the State (whereas they covered nearly 45% at the beginning of the century). Most of the tribal populations of the State are living in these forest areas, and were following the ancestral practice of slash and burn cultivation. Little by little they were forced to move deeper inside the forest areas as the forest margins were deforested or occupied by new settlers coming from the highly populated lowlands and midlands of the State. In order to stop or reduce the damages caused to the forests, the government forced the nomadic tribal people to settle in well demarcated areas in the forest, but this affected the practices and the lifestyle of these people. Nowadays these people feel being despoiled of their land and start claiming their rights. The question of the participative forest management is then a challenge for the Kerala Forest Department which set up a policy combining production and conservation. The present stake for the government is thus to consider the forest as a resource to be shared. But due to the professional background of the foresters, to take the traditional knowledge and practices of the local communities into account for a sustainable forest management is something new, and many tensions arise.

# Richerche sperimentali per una gestione sostenibile dei cedui di leccio: opzioni colurali a confronto

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## Abstract

The paper describes traditional managements forms applied to some coppice woods of *Quercus ilex*. After the evaluation of the sustainability of these forms nowadays, the results of investigations regarding possible silvicultural options are reported. The study area is located on the Promontory of Gargano, inside the National Park of Gargano. The pure stands of Quercus ilex have an extension of approximately 10.000 hectares, in the past they were used to produce charcoal, now abandoned because of the introduction of new energy sources in the '50. Today they have some economic interest because of the age of the shoots and the increasing economic value of harvested wood. This new interest is in contrast with the public opinion, not accepting the aesthetic aspects originated by the application of management forms such as coppice with standards, removing large amount of denuded land with some standard trees left. In this case the visual impact is increased by the morphology of the territory and the presence of rock outcrops, generating important chromatic effects due to the application of this management form, compared to the woodlands not affected by cuttings. The results of different management forms experimented in the last 13 years are presented and discussed also from the aesthetic point of view.

## 1. Premessa e finalità della ricerca

La gestione del bosco fino a qualche tempo fa rappresentava un evento acquisito nella cultura della popolazione italiana. Bisogna considerare a questo proposito che agli inizi del 1900 circa il 44% della popolazione era dedita all'agricoltura e, comunque, la quasi totalità della popolazione utilizzava il legno come fonte energetica, per la costruzione di attrezzi e manufatti etc. Questa situazione si è protratta fino a circa la metà del 1900.

Per queste ragioni, probabilmente, nell'opinione pubblica era ben consolidata l'idea della necessità di sottoporre i boschi a regolare gestione. In verità non mancano anche in epoche abbastanza remote, sporadici casi di prese di posizione di associazioni e, più di rado, di popolazioni contro determinati interventi selvicolturali, ma a ben guardare, in generale, si tratta di prese di posizioni qualificate, contro una cattiva gestione del bosco, di persone che si preoccupano della sopravvivenza del bosco. Interessante a questo proposito anche uno scritto di Geneau (1926), divenuto un punto di riferimento per il trattamento estetico e ricreativo dei boschi. L'Autore esamina l'approccio che persone di differente cultura hanno nei riguardi del bosco e dei lavori forestali e, in definitiva, il tipo di gestione ideale secondo il proprio punto di vista, a sua volta strettamente collegato alla propria cultura.

Bisogna prendere atto che ormai nella società moderna l'azione antropica sul bosco è spesso vista in chiave negativa. Di conseguenza gli interventi selvicolturali, non di rado, sono valutati per lo più in base ad aspetti emotivi (ad es. l'impatto visivo immediato), senza tener conto degli aspetti normativi, del tipo di intervento, delle ricadute bioecologiche, degli aspetti economici etc.

Gli stessi tecnici e la Pubblica Amministrazione, nelle proposte progettuali e negli atti autorizzativi, non di rado sono condizionati dalla reazione dell'opinione pubblica: spesso si adottano soluzioni di compromesso che, non sempre, superano la critica della valutazione di lunga durata.

La ricerca riguarda alcuni cedui invecchiati di leccio, ubicati sul Promontorio del Gargano, un tempo governati a ceduo per ottenere legna da ardere e carbone, sottoposti a "dicioccatura" secondo una tecnica fortemente impattante, attuata per aumentare il prelievo delle masse legnose, che prevedeva l'estrazione di una parte dell'apparato radicale in occasione del taglio del ceduo.

La dicioccatura, per il solo effetto traumatico a carico di importanti parti vitali delle piante, ha enormemente ridotto la biodiversità naturale di queste formazioni forestali , fino a determinare, nelle situazioni più favorevoli, la rarefazione delle specie arboree meno frugali del leccio naturalmente consociate ad esso e, in quelle meno favorevoli, assieme al pascolo selvaggio e agli incendi, la scomparsa del bosco. In molti casi tutto ciò ha determinato gravi fenomeni di dissesto idrogeologico.

L'impatto sul paesaggio sicuramente era enorme dato che l'utilizzazione, oltre ad interessare la biomassa epigea riguardava, come si è detto, anche una parte della biomassa ipogea. I primi strati del substrato pedologico erano sconvolti e, come è facilmente deducibile, l'erosione superficiale su superfici in pendìo doveva essere notevole.

Inoltre, dopo l'utilizzazione del ceduo anche la ripresa vegetativa da parte delle ceppaie non poteva essere vigorosa, come di solito avviene nella primavera successiva al taglio, se l'utilizzazione è stata effettuata nel rispetto dei regolamenti forestali e della buona tecnica selvicolturale

Gli obiettivi proposti mirano a verificare la sostenibilità di pratiche selvicolturali tradizionali, e talvolta storiche, nonchè la risposta di determinate opzioni colturali, oltre che dal punto di vista tecnico, sul paesaggio. Gli indirizzi selvicolturali messi a confronto tengono nel dovuto conto la nuova realtà economica e ambientale in cui vengono a trovarsi i cedui di leccio, in particolare all'interno del Parco Nazionale del Gargano, istituito con la L.394/91.

Le opzioni colturali possibili nella realtà da noi esaminata possono ricondursi sostanzialmente al mantenimento del sistema ceduo con un numero più o meno elevato di matricine, alla conversione in fustaia o alla conversione da ceduo matricinato a ceduo composto oppure all'abbandono delle pratiche colturali.

Partendo da queste considerazioni di carattere generale l'Autore a distanza di 13 anni dall'esecuzione degli interventi selvicolturali, condotti a scopo sperimentale su aree di saggio, esamina i risultati preliminari conseguiti relativamente a:

a) impatto visivo conseguente alle opzioni colturali adottate;

b) stabilità dei soprassuoli nei confronti delle avversità meteoriche ;

c) biodiversità;

d) prospettive di medio e di lungo periodo.

Pur nella consapevolezza che i risultati di lungo termine saranno pienamente valutabili soltanto tra molti anni, l'Autore riporta alcune valutazioni derivanti dalle osservazioni condotte sulle aree sperimentali sottoposte a continuo monitoraggio. Vengono infine riportate alcune proiezioni basate sui trend evolutivi e su dati di letteratura.

## 2. Cenni sulle aree sperimentali

Le aree oggetto del presente studio sono ubicate in località "Inversa di Spigno", nel Comune di Monte S. Angelo (FG). Esse si trovano ad una quota di circa 650 m s.l.m. su un versante con circa il 40% di pendenza esposto a sud. I suoli, attribuibili a rendzina, presentano spesso la matrice calcarea affiorante. Il clima è di tipo mediterraneo con precipitazioni intorno a 650-700 mm/anno, forte umidità atmosferica e 3 mesi di aridità estiva (sensu Bagnouls-Gaussen).

Le aree sperimentali sono state realizzate in un ceduo invecchiato (circa 45 anni dall'ultimo taglio) in una zona ricca di fauna selvatica e soggetta a uso civico di legnatico e di pascolo. La composizione specifica è dominata da leccio con partecipazione sporadica di orniello e carpino. La densità è colma ed il numero di ceppaie elevato. Dal punto di vista fitosociologico la lecceta è attribuibile all'*Ostryo-Quercetum ilicis*.

Il sottobosco è rappresentato soprattutto da *Asplenium onopteris, Asplenium trichomanes, Cyclamen neapolitanum, Ruscus aculeatus*, specie tutte caratteristiche della lecceta.

## 3. Materiali e metodi

Il materiale di studio è costituito da 15 aree di saggio, della superficie di 1600 metri quadrati ognuna, disposti secondo un disegno sperimentale a blocchi randomizzati.

Le tesi poste a confronto, replicate tre volte, ricalcano le differenti opzioni colturali possibili in simili situazioni:

– TESI A – trattamento a ceduo matricinato con 50 portasemi per ettaro;

– TESI B – trattamento a ceduo intensamente matricinato, con 250 portasemi per ettaro;

– TESI C – trattamento a ceduo composto con 140 matricine per ettaro di cui 80 di 1 a turno e 60 di 2 turni;

– TESI D – conversione ad alto fusto;

– TESI E –nessun intervento (evoluzione naturale o controllo).

Le aree sperimentali sono state sottoposte a monitoraggio periodico allo scopo di dare, per quanto possibile, una risposta ai quesiti sopra riportati. L'impatto visivo è stato valutato attraverso l'esame di foto panoramiche multitemporali in cui l'effetto negativo del trattamento è stato parametrizzato mediante la variazione cromatica (dominanza/abbondanza del colore bianco) conseguente alla parziale e temporanea scopertura della matrice litologica di origine calcarea che alcune opzioni colturali hanno comportato. La stabilità dei soprassuoli nei confronti delle avversità meteoriche è stata valutata attraverso la quantificazione delle piante troncate o sradicate da neve e vento oppure dalla loro azione congiunta. Le variazioni in termini di biodiversità sono state valutate attraverso l'applicazione dell'indice di Shannon ad aree di saggio opportunamente individuate all'interno delle parcelle sperimentali. Le prospettive di medio e di lungo periodo sono state effettuate sulla base di proiezioni delle valutazioni di cui sopra, di esperienze dell'Autore e di dati di letteratura .

## 4. Risultati e Discussione

Le indagini eseguite hanno consentito di affermare che, dopo il taglio di maturità del ceduo, si afferma un'abbondante rinnovazione da seme in tutte le tesi (mediamente sono presenti oltre 20.000

semenzali/ha). Detta presenza è risultata significativamente correlata al trattamento nel senso che minore risulta l'aduggiamento da parte delle matricine, più abbondante risulta la presenza di semenzali. Detta importante componente del ceduo matricinato subisce una forte contrazione nel tempo.

I dati sulla rinnovazione agamica del leccio hanno consentito di affermare la pronta risposta delle ceppaie nella emissione dei polloni tanto che già alla fine del 2° anno il suolo è quasi interamente coperto. Anche per quanto riguarda lo sviluppo in altezza è risultata una sorprendente velocità di crescita tanto che già al 4° anno di vegetazione si avevano altezze mediamente intorno ai 2-2,5 metri con piccole differenze a favore delle tesi con un minor numero di matricine per ettaro. I cedui con una minor intensità di matricinatura hanno emesso un maggior numero di polloni, cui corrisponde anche un diametro medio e un'altezza media maggiore rispetto alle altre tesi. Dette differenze, statisticamente significative nei primi anni successivi al taglio di maturità, hanno manifestato un trend che si è praticamente annullato nel tempo.

L'analisi sui danni provocati dal vento e dalla neve ha permesso di formulare alcune considerazioni. Innanzitutto il forte vento ha causato soprattutto lo sradicamento delle piante, mentre la neve ha provocato numerosi schianti a carico delle matricine. Dai dati raccolti è emerso che i danni, per quanto riguarda la loro intensità, sono notevolmente diversi al variare del numero di matricine rilasciate a dote del bosco.

Tra le aree a ceduo, quelle con 250 matricine/ha hanno avuto il maggior danno, sia in termini assoluti che percentuali. All'interno di questa tesi, in media gli schianti hanno interessato circa il 50% delle matricine. Le aree rappresentative del ceduo con rilascio di 50 matricine/ha hanno subìto danni che in media hanno interessato il 37% delle portasemi presenti dopo il taglio di maturità. Nelle parcelle sperimentali a ceduo composto sono state danneggiate circa il 12% delle matricine.

Tabella 1. Numero e dati dendrometrici dei semenzali di leccio (valori medi per tesi riferiti ad ettaro) ed indici statistici derivati dall'analisi della varianza

| | Numero semenzali/ettaro | | | Diametro al colletto (mm) | | | Altezza (cm) | | |
|---|---|---|---|---|---|---|---|---|---|
| TESI | 1994 | 1995 | Mort. % | 1994 | 1995 | Δd | 1994 | 1995 | ΔH |
| TesiA | 27333 | 24235 | 11.3 | 4.3 | 5.4 | 1.1 | 20.9 | 28.7 | 7.8 |
| TesiB | 24667 | 21387 | 13.3 | 3.3 | 4.8 | 1.5 | 16.8 | 27.8 | 11.0 |
| TesiC | 20500 | 18967 | 7.4 | 3.7 | 5.3 | 1.6 | 15.1 | 20.6 | 5.5 |

| | Coefficienti statistici 1994 | | | Coefficienti statistici 1995 | | |
|---|---|---|---|---|---|---|
| PARAMETRI | $F_{2/4}$ | $F_{0.05}$ | P | $F_{2/4}$ | $F_{0.05}$ | P |
| N° semenzali | 11.498 | 6.944 | <0.05 * | 32.283 | 6.944 | <0.05 * |
| Diametro colletto | 6.449 | 6.944 | 0.056 | 0.382 | 6.944 | 0.705 |
| Altezza | 5.207 | 6.944 | 0.077 | 4.324 | 6.944 | 0.085 |
| Mortalità | | | | 1.625 | 6.944 | 0.304 |

I danni nei soprassuoli più densi (testimone e conversione), in percentuale, sono risultati rispettivamente il 2.8% e il 21% rispetto alle piante in piedi. Visto il maggior numero di piante qui presenti, le perdite sono state, in media, di 196 unità (17 $m^3$/ha) per le aree testimoni e 413 unità (28 $m^3$/ha) per la conversione.

Tabella 2. Principali parametri dendrometrici dei polloni di leccio (valori medi per tesi e dati ad ettaro) e indici statistici derivati dall'analisi della varianza

| | Numero polloni/ha | | Diametro (mm) | | | Altezza (cm) | | |
|---|---|---|---|---|---|---|---|---|
| TESI | 1994 | 1995 | 1994 | 1995 | Δd | 1994 | 1995 | ΔH |
| Tesi A | 40553 | 39666 | 8.1 | 13.5 | 5.4 | 71.4 | 132 | 61 |
| Tesi B | 27680 | 26988 | 6.7 | 11.6 | 4.9 | 55.0 | 112 | 57 |
| Tesi C | 30325 | 27550 | 6.6 | 11.9 | 5.3 | 59.2 | 120 | 61 |

| | Coefficienti statistici 1994 | | | Coefficienti statistici 1995 | | |
|---|---|---|---|---|---|---|
| Parametri | $F_{2/4}$ | $F_{0.05}$ | P | $F_{2/4}$ | $F_{0.05}$ | P |
| Numero polloni | 8.319 | 6.944 | <0.05 | 11.552 | 6.944 | <0.05 |
| Diametro | 1.686 | 6.944 | 0.294 | 1.793 | 6.944 | 0.278 |
| Altezza | 0.667 | 6.944 | 0.562 | 0.684 | 6.944 | 0.554 |

Tabella 3. Mortalità dei polloni di leccio e nuovi ricacci da parte dell e ceppaie

| | | TESI A | | | TESI B | | | TESI C | |
|---|---|---|---|---|---|---|---|---|---|
| | Poll/cepp | Morti | Nati | Poll/cepp | Morti | Nati | Poll/cepp | Morti | Nati |
| 1994 | 36.6 | | | 32.0 | | | 30.6 | | |
| | | 13.1 | 12.4 | | 11.2 | 10.5 | | 10.9 | 8.1 |
| 1995 | 35.8 | | | 31.2 | | | 27.8 | | |
| Mortalità | | 35.9% | | | 35.1% | | | 35.7% | |

L'analisi sui danni ha evidenziato la differente resilienza dei soprassuoli studiati agli eventi meteorici. I dati mostrano l'importanza nei riguardi dei danni dovuti alle avversità atmosferiche dei valori ipsodiametrici delle matricine. Le aree meno danneggiate sono risultate quelle in cui vi è stato il rilascio di un minor numero di matricine, che contemporaneamente, hanno subito una selezione più severa e, da un punto di vista dendrometrico, rispondevano a parametri ipsodiametrici sufficientemente sicuri nei riguardi della stabilità fisica delle piante (la Marca 1983). In definitiva, nel caso studiato, il rilascio di un elevato numero di matricine ha avuto come conseguenza una selezione meno severa e rapporti ipsodiametrici indicatori di una non sufficiente stabilità strutturale. Sembra utile sottolineare anche che i cedui matricinati hanno una fase di labilità statica proprio nei primi anni dopo il taglio (mentre successivamente si ha un graduale riequilibrio dei parametri ipsodiametrici): emerge quindi l'importanza di un'attenta selezione delle matricine da rilasciare che dovrebbero essere di buon sviluppo e portamento, soprattutto nei riguardi della chioma. Le aree a ceduo lasciato all'evoluzione naturale e quelle in cui è stata effettuata la conversione, inoltre, hanno subìto considerevoli danni in termini assoluti. In ogni caso la compattezza della copertura ed anche l'efficienza del soprassuolo non è stata compromessa.

Per quanto riguarda la biodiversità nelle aree sottoposte a ceduazione si ha una maggiore ricchezza floristica per l'"ingresso" di specie erbacee ed arbustive, soprattutto di prato e di radura inversamente correlate alla copertura arborea costituita dalle matricine e dagli allievi relativamente alle aree convertite all'alto fusto. Le aree floristicamente più povere sono risultate quelle lasciate all'evoluzione naturale (testimoni). La fig. 1 riporta i risultati dell'indice di diversità secondo Shannon (la Marca et al. 1995). Detta diversità floristica tende ad annullarsi con il tempo man mano che aumenta il grado di copertura da parte delle piante arboree.

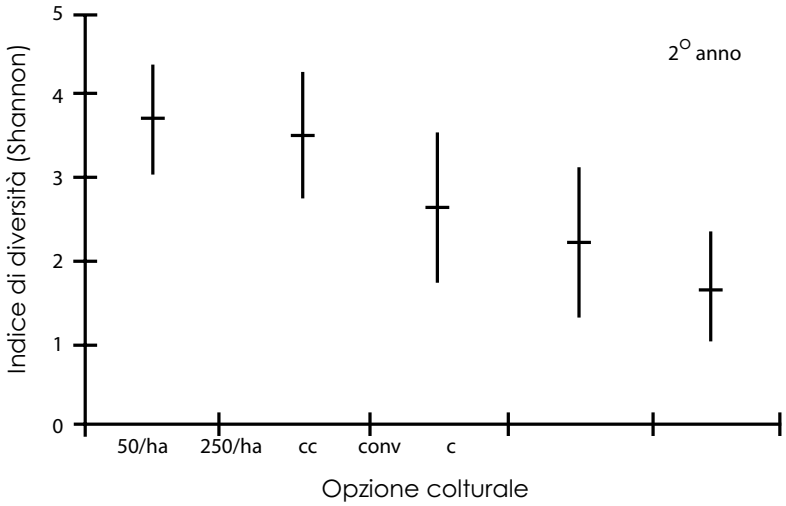


Figura 1. Risultati dell'applicazione dell'indice di Shannon per la valutazione della diversità floristica secondo le diverse opzioni colturali.

Figure 1. The results of the application of Shannon index to assess floristic diversity, according to the different management forms.

L'impatto sul paesaggio, valutato come sopra indicato, ha dimostrato che dal momento in cui viene eseguita l'utilizzazione del ceduo fino alla ripresa vegetativa la percezione del taglio è tanto più elevata quanto minore è il numero di matricine rilasciate a dote del bosco. Di contro sia la zona convertita ad alto fusto che quella che ha ospitato le aree testimoni, hanno fatto registrare un impatto praticamente poco o affatto percettibile. Si tenga presente a questo riguardo che immediatamente dopo l'esecuzione degli interventi selvicolturali posti a confronto è risultato che i soprassuoli governati a ceduo avevano una copertura del suolo che in media variava dal 7-10 % (ceduo con 50 matricine/ha) a circa il 30% (ceduo con 250 matricine/ha; quelli governati a ceduo composto avevano una copertura del suolo poco discosta da quella registrata nei cedui più intensamente matricinati mentre per i soprassuoli rispettivamente avviati all'alto fusto oppure lasciati all'evoluzione naturale, detti valori oscillavano tra il 90 ed il 100%.

Già dopo un anno dal taglio del ceduo, per la pronta ed abbondante emissione di polloni, l'impatto dovuto al denudamento del suolo è fortemente diminuito fino ad annullarsi del tutto in pochi anni. L'analisi di riprese fotografiche multitemporali ottenute con aerostati, con elicotteri e da terra, posizionandosi in questo caso in punti panoramici, opportunamente elaborate al computer, offrono una visuale diretta delle considerazioni sopra riportate.

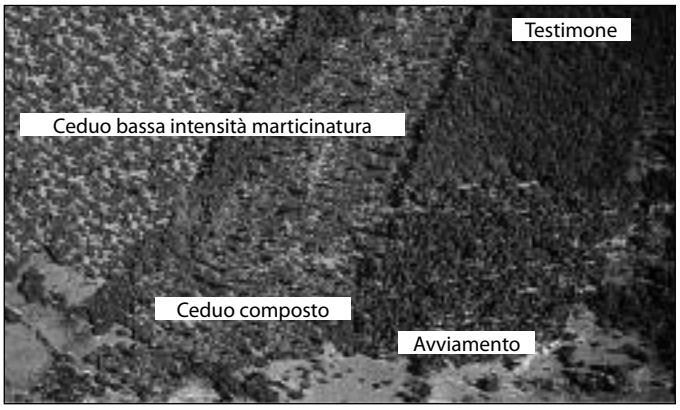


Figura 2. L'aspetto delle parcelle dopo un anno dal taglio.

Figure 2. The experimental plots one year after cutting. From left to right: plot with low density of standards, plot of mixed coppice, plot with conversion to high stands below, with area not affected by cutting above.

E' interessante osservare che a distanza di 13 anni dall'esecuzione degli interventi le zone a ceduo con differente intensità di matricinatura non presentino tra loro differenze nelle percezioni visive. Lo stesso discorso vale se il confronto interessa le zone avviate ad alto fusto oppure lasciate all'evoluzione naturale. Se invece il confronto avviene tra zone a ceduo e zone in conversione (naturale o guidata) si percepisce unicamente una differente tessitura: nelle zone a ceduo il piano delle chiome delle matricine sovrasta quello delle chiome dei polloni, mentre il manto verde delle zone in conversione appare decisamente più omogeneo.

Figura 3. Impatto sul paesaggio 13 anni dopo il taglio

Figure 3. Impact on landscape 13 years after cutting

## 5. Conclusioni

Lo studio sulle diverse opzioni colturali condotto in una lecceta del Gargano, ha consentito, seppur in via non ancora definitiva, di differenziare alcuni effetti di varie forme di gestione. Il „problema ceduo", in generale, può essere affrontato mediante adozione di scelte gestionali differenti: mantenimento del governo a ceduo; conversione a fustaia; abbandono all'evoluzione naturale.

Il lavoro, a partire da queste considerazioni, rappresenta un ulteriore contributo sperimentale volto all'acquisizione di precise conoscenze in merito alle tecniche selvicolturali più idonee per il conseguimento di un determinato scopo, nonché agli effetti degli interventi sull'impatto visivo delle differenti opzioni selvicolturali. Sicuramente, tenuto conto delle condizioni socio-economiche che il territorio in esame presenta, il governo a ceduo per la produzione di legna da ardere, oltre a rappresentare la forma di governo tradizionale, offre un prodotto ancora richiesto dal mercato.

In alternativa grande interesse potrebbe avere anche il ceduo composto che, insieme ad una elevata produzione di ghianda adatta per l'alimentazione della fauna selvatica e del bestiame in produzione zootecnica, offre una buona stabilità fisica delle piante ed anche una significativa produzione legnosa; il ceduo composto, infine, ma non in ordine di importanza, rispetto al ceduo più o meno intensamente matricinato garantisce effetti positivi anche dal punto di vista paesaggistico-ambientale.

C'è da osservare che i cedui di leccio sono stati in equilibrio secolare con l'ambiente e lo hanno caratterizzato. Pertanto, anche per tali motivi, è auspicabile una ripresa, seppur parziale, di tale forma di governo. D'altra parte anche la Legge Quadro 394/91 sui parchi incentiva e promuove le attività tradizionali antropiche presenti nei territori divenuti Parchi. In questa ottica i problemi da affrontare per una ripresa di tale forma di governo riguardano soprattutto gli interventi volti al miglioramento del sistema ceduo.

I risultati conseguiti hanno mostrato che i cedui di leccio presentano tutti i requisiti per una prosecuzione delle ceduazioni. Il numero di matricine da rilasciare dovrebbe anche essere in stretto rapporto con la capacità pollonifera delle ceppaie e con l'abbondanza e frequenza delle fruttificazioni. Il leccio, a questo riguardo, presenta caratteristiche ottimali sia nei riguardi della rinnovazione agamica che della frequenza delle fruttificazioni.

Lo studio, inoltre, evidenzia l'importanza della qualità delle matricine rilasciate, spesso correlata in maniera indiretta alla loro quantità: un rilascio di matricine aventi rapporti ipsodiametrici elevati e caratteristiche morfometriche della chioma poco rispondenti al loro ruolo di portasemi, anche se numerose, comporta un rischio notevole nei primi anni dopo il taglio rispetto ad eventi meteorici a carattere nevoso.

L'impatto visivo determinato dal taglio del ceduo assieme all'erosione (anche se da noi non è stata oggetto di quantificazione) della sostanza organica accumulata va valutata attentamente, c'è da osservare però che si tratta di un impatto duraturo ma non permanente. Di contro va considerato che la futura fustaia deve offrire (nel nostro caso la questione non è ancora risolta) assolute garanzie nella fase di rinnovazione da seme.

Le prospettive di lunga durata, tenuto conto delle condizioni pedologiche della stazione e considerato la sporadica presenza di altre specie arboree che naturalmente si associano al leccio e che da un punto di vista ecologico sono considerate più esigenti del leccio, a nostro parere non offrono ancora assolute garanzie da questo punto di vista.

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# Cultural forest landscapes and ecological imperialism

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## Abstract

The scenic aesthetic, although interpreted variously, draws on a long tradition of landscape design for visual pleasure. It is threatened by more aggressive application of an ecological aesthetic, which requires cultural landscapes – both those designed for delight, and those which incidentally impart delight – to emulate nature, or to revert to nature. Examples from the UK show the aesthetic problems that subservience of scenic to ecological desiderata may bring, at a time when scenic design principles have begun to improve the landscapes of commercial forestry. Support for the ecological aesthetic derived from public questionnaires is questionable. The scenic aesthetic may itself have ecological functionality, and be more durable than some ecologists have supposed.

## 1. Introduction

Traditional cultures are not necessarily naïve, static and subsistence-scale, but may be sophisticated, innovative and even affluent. They are not concerned only with material production, but with an aesthetic environment that gives comfort, contentment, and a sense of communal identity. Aesthetic considerations have long been evident in humans' manipulation of and response to their inhabited landscape, often but not inevitably linked to religious observances. This paper views these propositions in the context of the cultural landscapes of the UK, and of the threats posed to them by the so-called "ecological aesthetic".

## 2. Two aesthetic perspectives

The scenic aesthetic asserts that landscapes which delight the eye are, simply by that token, meritorious. As perceptions of the world have developed, traditions of aesthetic design have grown and diversified. Though all are concerned with visual appearance, manifestations range from formal and geometrical gardens, through naturalistic landscapes based on picturesque ideas of composition, to landscapes where human intervention has itself been subjugated by nature, to human-dominated industrial landscapes which emulate the sublime power of nature, perhaps in awesome or shocking mood. Through time, one manifestation has succeeded another in popularity. Historically important formal landscapes were swept away by the naturalistic compositions of William Kent, Lancelot Brown and Humphry Repton, spawning controversies which entered not only academic treatises (Price, 1810), but even contemporary novels (Austen, 1814).

But, although the constitution of the scenic aesthetic varies through time and across space, underlying this range is – it is asserted – a constant set of principles of aesthetics, mixed in different proportions. There are numerous expositions of what, precisely, these principles should be called (Crowe, 1966; Lucas, 1991; Miles, 1967; Price, 2000), but their content and implications for the practice of forestry are in close agreement. This is the scenic aesthetic tradition.

By contrast, the rising ecological aesthetic (see Sheppard and Harshaw, 2001) asserts some combination of the following.

- Only when nature arranges vegetation and wildlife are they sustainable.
- Nature is usually untidy and often richly diverse at the small scale, unlike prevalent human land use patterns.
- The scenic aesthetic is an arbitrary cultural construct (as proved by cultural differences and changing fashions).
- The land use patterns which the scenic aesthetic promotes threaten the Earth's sustainability (with or without its human inhabitants).
- When people understand ecology, their aesthetic preferences realign with the ecological aesthetic.
- Anyway, people should be given landscapes conforming with the ecological aesthetic; and, the principles of scenic aesthetics being arbitrary, in time they will prefer ecological landscapes.

It should be noted that not all ecologists subscribe to all of these, and some might not subscribe to any. Some indeed understand and appreciate the scenic aesthetic (Botkin, 2001).

### 3. A conflict of perspectives

An aesthetic based on ecological premises may be hostile to cultural landscapes of two kinds. The first is deliberately created for delight, as manifested in the tree-rich gardens and parks surrounding the homes of the elite, e.g. French chateaux, German Schlosses, Scandinavian slotts, British stately homes. Such landscapes of delight may also be found in the public domain, in the urban parks of Europe's great cities – and even, in aspiration, on the derelict land of its new towns. They are essentially landscapes of affluence, created by – though not necessarily for – people whose subsistence needs are guaranteed, and who have resource margins generous enough to permit deliberate satisfaction of aesthetic needs. For the time being, these landscapes are protected from ecological colonisation by being, on the one hand under private control, and on the other enormously and patently valued by the public. Yet they are in principle offensive to the hard-line ecological aesthetic because they are "merely" aesthetic, a manifestation of frivolous pleasure-seeking.

The second kind of cultural landscape arises, primarily, as an aesthetic accident, from the practices of utilitarian cultivation for agriculture and forestry and of partial industrialisation and urbanisation of the rural landscape. These may be subsistence landscapes, arising from the need to understand nature sufficiently to coax from her the means of survival. But they may also be affluent landscapes, created by the zeal of innovators and improvers, as in Britain's Agrarian Revolution of the 18$^{th}$ century. While less deliberately influenced by aesthetic considerations, nonetheless the long-term relationship of human need and endeavour with the potential of the land very often seems to create a satisfying aesthetic experience. Such landscapes may be deemed offensive to the ecological aesthetic because they are "not like nature".

The extreme opposite vision that the ecological aesthetic would offer is of a polarised world, in which a few privileged humans live in enclaves called cities, and are largely excluded from surrounding landscapes, which develop autonomously under ecological forces. Their food and fibre and energy are derived by highly intensive cultivation of a small periphery of non-nature reserves, or perhaps by import from countries whose degraded ecosystems are out of sight and out of mind. According to this vision, cultural landscapes are what you hang on your wall, in between cultural portraits.

If human influence remains in the rural landscape, it is increasingly constrained to follow whatever is perceived as "nature's way". Landscapes of aesthetic delight are decried as self-indulgent, and are commanded to revert towards wilderness, which may be visited and even exploited, but only under strictly controlled conditions. Utilitarian landscapes are managed under nature-like agriculture. Hunter-gatherers roam savannah landscapes. Decorative parkland wildlife becomes prey again. Perhaps cyclical and shifting small-patch cultivation occupies forests. Near-to-nature forestry becomes back-to-nature forestry, self-managing, with harvests focused on unsystematically wind-, insect- or fire-killed trees (when not required as bark-beetle habitat).

Perhaps no-one, yet, explicitly espouses such an extreme vision: but it is the logical end-point of imposing the ecological aesthetic consistently. Before setting foot on this road, we should be conscious of where it may lead.

## 4. Scenic landscapes in Britain

A few examples from Britain illustrate the aesthetic qualities which may be threatened by a fundamentalist ecological aesthetic (and, paradoxically, by changing economic conditions).

### 4.1. Stately parks

Parks surrounding the stately homes of aristocracy, nobility and gentry often include formal elements close to the house (see figure 1), dissolving into a landscape of traditional agricultural practices on one hand, and on the other into contrived wilderness-emulating woodland (where, however, timber is carefully and productively managed). Here the open spaces, and their carefully constituted and located groups of trees are respectively threatened by woodland succession, and long-term disintegration of the pattern of tree groups, if scenic management is withheld or outlawed, as indeed it has been in some cultural landscapes in Continental Europe.

Figure 1. Classical UK park design at Mellerstain House, South Scotland

### 4.2. The Lake District

The English Lake District embodies the Romantic culture of Europe in late 18$^{th}$ and early 19$^{th}$ centuries, richly connected to the poetic circle of William Wordsworth and the analytical aesthetics of John Ruskin. Those strata of society who had become accustomed to taking the cultural European Grand Tour in earlier decades, in the unsettled times of European military strife had found this alpine gem on their own doorsteps. It remains primarily a place of aesthetic delight, and is the UK's most popular tourist national park. The landscape mixes sublime mountains, with the tranquil beauty of landscapes arising from the pastoral tradition of transhumance. Small woodlands appear as though informal remnants of once-great forests, but in reality were often planted for timber production and for scenic effect. In an early expression of the ecological aesthetic, Wordsworth (1835) referred to a pioneering conifer plantation as a "damned vegetable

factory", but in truth conifers contribute positively to the park's picturesqueness. The National Trust of England and Wales, dedicated to preserving places of historical interest and natural beauty, purchased its first property here more than 100 years ago, and has since combined the preservation of human history and natural beauty, by something not far removed from gardening. Conifers are a cherished part of its portfolio.

When reforestation began in the district about 80 years ago, however, it was with even-aged monocultures of exotic species – the much-abused coniferous blanket – which were intended solely for material production. In the early decades, there was outcry against their curious and unaccustomed colours and textures and configurations (Symonds, 1936): scenic aesthetes were more vocal than ecologists in their criticism. And yet in time elements of the old design traditions were rediscovered. Although in the 1980s clear felling executed dramatic change to canopy and texture, it also brought opportunities to introduce design principles. Harsh edges were broken up to reflect underlying micro-topography. Two hundred years earlier, Humphrey Repton had advocated a dramatic contrast between architectural outlines and those of trees: here, the outlines of trees reflect those of terrain, an integration of qualities which is more appropriate to a setting where nature remains the dominant component of landscape. An association of rock and spiring tree crowns reminiscent of the Alps is being created. I grew up familiar with this evolving landscape: my traditional knowledge is about how to reconcile beauty and usefulness; and it should not be ignored because I am not poor, and not yet dead.

Figure 2. Thirlmere: commercial conifers begin to integrate with the aesthetic qualities of the mountainside

Similar lessons of integration had been absorbed in earlier, nearby plantings by a water company at Thirlmere. Species mixtures reflect the rough and richly diverse surface texture of the mountains above, and are reflected in the shifting patina of the lake below. But the components are non-native species. Now, under some obscure 19$^{th}$ century legislation, the imperative is to restore the margins of the lake to "trees native to the Lake District". The effect of a bright green surround of such broadleaved species, against the remaining dark conifers, may easily be envisaged. And fundamentalist ecologists will not be content until all the conifers are replaced. Just when the scenic aesthetic's beneficent possibilities are being appreciated, its application is threatened with banishment.

### 4.3. Grazing and nature

The Lake District's landscape is also presently vulnerable to the economic decline of agriculture, and consequent loss of grassland to broadleaved scrub. It is grazing by indigenous, colour-coordinated Herdwick sheep that has kept this encroachment at bay, and imparted the manicured hillsides much-admired by Britons – though less so by continental foresters. The sheep have also been responsible for some naturalistic, ragged edges to forests where conditions are near the limit for tree growth, and can hence have a further role as unsalaried landscape designers. But there is enthusiasm among some nature conservationists to restore a wolf population here, to keep brows-

ing animals under control and hasten the growth of scrub. (It is said to be in the Lake District that the last wolf in England was killed, in the 17th century.) One might suspect that some conservationists hope that its return will keep numbers of recreationists away, if not down.

Yet elsewhere in Britain, where heathland is "supposed" to exist, its restoration from high forest, or protection against scrub encroachment, is being actively promoted by conservation agencies. Domesticated animals such as long-horn cattle are employed to trample woody vegetation. Alien species such as the alpaca are imported to protect another alien species, the sheep against attacks by domestic dogs, so they may continue to browse away regeneration undisturbed.

The rules of the game are not always easy to understand.

### 4.4. Kielder Forest

Kielder Forest in northern England, and its adjacent Scottish forests, were planted during the 20th century, across terrain deforested through centuries of pastoral agriculture and decades of "sporting" use, using exotic species for strategic timber supply, in extensive, even-aged monocultures (95% of the cover being with non-native species). It became one of the largest human-made forests in Europe. As in the Lake District, lovers of the open landscape protested, not just about the alien species, but about the scale of the invasion. And yet these are "forests that go on for ever, in a land which is infinite too" (Price, 1968).

The forest also now contains one of the UK's largest reservoirs. The coming of this reservoir has fundamentally altered the relationship between valley and forest. Previously, the pattern of small fields, woods and farmsteads of the valley bottom could have merged into a pattern of fellings whose scale increased with distance from the valley, a fringe of contrast giving emphasis to the huge expanses of monocultured trees beyond. Now, however, everything is large-scale. In this vast landscape, the scenic aesthetic might favour felling on a commensurately grand scale (see figure 3), as advocated in the state Forestry Commission's first guide to landscape design (Crowe, 1966). The UK lost its forest culture in the Industrial Revolution: here, that culture has re-invented itself, in a modern interpretation. However, ecological thinking, masquerading as landscape design, is now targeting the forest landscape for remodelling into a perceived more natural condition, with more intimate mixing of species, more emphasis on native species, and preference for regeneration areas on an unfitting, pocket-handkerchief scale. Where possible a multi-storey canopy would be preferred.

Figure 3. Large-scale treatment of a large-scale landscape in Kielder Forest

A further imperative, derived from environmental certification requirements (UKWAS Steering Group, 2000), is to avoid large expanses of even-aged regeneration, by prohibiting felling of adjacent blocks within 7 years of each other. But this will simply lead to replication, on a smaller yet more intrusive scale, of the planted geometrical blocks which attracted so much aesthetic criticism in the earlier afforestation here.

Along the roadsides of the forest, the "small-scale is good and minuscule-scale is best" philosophy has been in operation much longer, with a bizarre multiplicity of tree species known mostly from Britain's suburbs, planted at regular spacing. But this effect is borrowed from the leisurely avenues of lowland stately parks, and does not match well in a rugged, working landscape (Price, 1968). Despite the initial objections of scenic aesthetes, this utilitarian landscape has discovered its own aesthetic merits, representing a type of planned landscape hardly found elsewhere in Europe.

A fundamentalist ecological aesthetic might regard even all these assaults on this landscape as insufficient concession, requiring removal of all exotics (with a probable 50–75% loss of productivity – and of associated jobs). The abundant present regeneration of the alien Sitka spruce suggests that energetic and on-going efforts will be needed to maintain this "natural" state. Perhaps the next stage is the suspension of any timber production at all.

Recreational use is now becoming common here. But there are also forces acting towards the confinement and commoditisation of aesthetic sensations offered. Cultural landscape can be interpreted as a carefully controlled and localised setting for art, as in the Skyspace construction by James Tyrrell, a circular building in the forest whose ceiling opens to frame a circle of sky overhead. Perhaps the fact of this installation is symbolic. Tree felling too can frame varied shapes and expanses of sky, for those who care to look, and if they are allowed to. And it is revealing that, near the artwork, a lone conifer – an accidental remnant from an earlier felling – is often identified by the visiting public as deliberate art too. The last thing a mass-media age should be cultivating in its rural landscape is a sense that beauty arises only as commissions are given, and our admiring attention is directed to them.

### 4.5. The continuous cover invasion

Widely in Britain's uplands, clear felling regimes have begun to produce a varied sequence of visual experiences within the uniform forests created in the 20$^{th}$ century. Views lost for many decades are opened up. Enclosed, intimate landscapes alternate intriguingly with vistas of lakes, mountains and human-made features. Thresholds of expectation are constructed, and fulfilled when views open suddenly, much as the designers of the 18$^{th}$ century picturesque tradition would have created them, but on a grander scale (figure 4). Forest landscape designers came to see clear felling as an opportunity, not only to improve the outward appearance of forests, but to make the experience within them more alluring (Lucas, 1991).

Figure 4. A view hidden for decades is revealed by clear felling in the Great Glen in Scotland

But these exciting possibilities are being sacrificed at the behest of a supposedly nature-based purism. Without any balancing of arguments, the National Assembly for Wales (2001) has promoted conversion of 50% of public forests to continuous cover structure (within a wholly unrealistic time-span of 20 years). By contrast with the landscape of clear cutting, such forests produce visual

sensations that are highly diverse at one point in space, but offer little sequential variety with progression through space, and may offer no views at all. Such opening up of big prospects is what I missed most, when I walked through the selection forests of the Vosges and the Dolomites.

## 5. The ecological aesthetic and public preference

The proponents of near-to-nature forestry are wont to highlight the results of visual choice experiments, in which the public predominantly prefers a single image of species-rich and structurally diverse woodland to a single image of monospecific even-aged stands. This, it is claimed, shows that the ecological aesthetic delivers a preferred landscape. What is not offered in the choice experiments is choice between portfolios of visual experience: one of which repeats the dense and intense variety that natural forces (sometimes) generate; the other of which represents the varied scenes that arise from a landscape of human intervention.

Similarly, recorded preference for some dead trees in the scene are routinely interpreted as an aesthetic preference for unmanaged forests. This preference, however, may be cognitive rather than perceptual, resulting from a belief that variety and naturalness are essential to sustainability. When the greatest preference appears to be for the lowest level among the offered amounts of dead trees, it is plausible that cognitive tokenism, rather than a genuine aesthetic preference for dead trees, is being expressed.

And one suspects that public preference would be considered less valid, if it declared in favour of rapid clearance of forest stands destroyed, untidily, by the natural forces of wind, fire, insects or climatic stress (Crocker, 1985).

## 6. Sustainability and the scenic aesthetic

Of course, ecological sustainability must have ultimate priority, because without ecosystems human systems do not survive. Of course the sustainability of unmodified ecosystems has been tested over a longer period than that of cultural landscapes. Yet the face of Europe is scattered with evidence of cultivated landscapes, in agriculture and forestry, which have proved durable over many centuries. And scenic preferences too have underlying durability (Parsons and Daniel, 2002). They are founded, not on caprice and fashion, but arguably on evolutionary functionality (Price, 2004).

For the ecologically orientated principles of naturalness and integrity, that functionality is evident. But variety and contrast too are emblematic of a world full of resources for survival. Pattern, with its components of repetition, development and climax, provides closer clues to where those resources may be found. Equilibrium of visual forces symbolises a world in which physical laws operate in a predictable way. Honesty offers assurance that things are as they are perceived to be: to that extent, the landscape is "safe". Even the more artistic principle of pleasantness, with its emphasis on pleasing proportions and colour combinations, appears to relate to mathematical rules which also underlie nature. The golden section ratio, for example, is the end-point of the Fibonacci sequence, which also determines numberness in a variety of natural phenomena.

Thus the principles of scenic aesthetics may themselves prove less transient than devotees of the ecological aesthetic might suppose. The loss of cultural landscapes, whether utilitarian or pleasurable, the loss of the culture that evolved and supported them, and of the aesthetic acuities that arose from their perception, may prove as intractable to reversal and recovery as the loss of distinctive ecosystems.

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# The "Conflict" between Traditional Forest Knowledge and Scientific Forest Management in Twentieth-Century Finland

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## Abstract

The forest sector has played a crucial role in Finland's national economy. The objective of this paper is to discuss the adaptation of the ideas of scientific forest management practices to Finnish private forestry and the reactions of the private forest owners. The key concepts are forest management by the selection system and devastation of the forests. The "conflict" between private forest owners and the forestry boards, representing scientific forest management, was entangled around these concepts and their interpretation throughout the period from the 1920s to the 1980s. The concept of environmental literacy is used to interpret the arguments presented by the parties to the "conflict". Characteristic of the environmental literacy of the forestry experts was that, until the 1980s, forests were firmly seen as a source of income. The authorities and scientists used forest improvement acts, the first of which was introduced in the early 1930s, to promote their mission of intensifying wood production, and by this means the private forest owners who favoured "traditional" methods of managing their forests were pushed into following the instructions of the forest authorities. The paternalistic attitude of the forestry boards towards forest owners when supervising implementation of the law and the open criticism of the principles of intensive forestry expressed in the early 1980s were clear reflections of the need to take the forest owners' perceptions of sustainable forestry into account in forest management as well.

**Keywords:** forestry, Finland, environmental literacy, selective cutting.

## 1. Introduction

Dr. P. W. Hannikainen, the Director of the National Board of Forestry (Metsähallitus) from 1903 to 1918, published a book in 1896 entitled *Suomen metsät kansallisomaisuutenamme* (Finland's Forests as National Property) (Hannikainen 1896). Sayings such as "The forests are Finland's green gold" and "Finland lives off her forests" reflect the special relation of the Finns and Finland to the forests. Characteristic of these sayings and many others concerning forests is that they remind us of the central economic role of forests in the well-being of the Finns. It is important to keep this in mind when trying to understand the behaviour of the Finnish forest scientists and authorities. They have been guardians of Finland's national property, as it were.

Before the beginning of the industrial revolution in Finland during the second half of the nineteenth century the most important economic use to which the forests had been put was tar burning, in addition to which almost all the building materials were taken from the forests and the principal energy supply was based on wood. The fast population growth and expansion of industrialisation in Western Europe was also reflected in the autonomous Grand Duchy of Finland (part of the Russian Empire in 1809-1917), in terms of an increased demand for sawn timber. The abolition of the mercantilist regulations governing production and trade led to an expansion in the production of sawn timber (Kuisma 1993).

In addition to the household use of wood, the founding of sawmills also soon touched upon the private forest owners. The problem from the silvicultural point of view was that only logs had market value. The cutting system in both private and state forests was based on selection for sawn timber and selective cutting according to a minimum diameter and the same principles were followed in the cutting of trees for building purposes. The impacts of the expansion in the mechanical wood processing industries could be soon observed in the Finnish forests. Following the increase in the economic value of the forests, cuttings expanded from the vicinity of water routes to more outlying areas (Björn 2000; Ahvenainen 1984).

The responsibility for managing the state forests in Finland has rested with the National Board of Forestry since 1859. The establishment of the National Board of Forestry started a new era in Finnish forestry in many ways. Visits by foreign forestry experts and the diffusion of forest management ideas and innovations from Central Europe, particularly from Germany, revealed the need to develop forest management practices and the forest legislation. The first significant forest law was laid down in 1886, the most important paragraph in it being that "the forest shall not be devastated", i.e. coniferous forests should not be felled for small-sized timber in a way which was contrary to the principles of rational thinning. The 1886 Forest Act primarily regulated the "concession cuttings" carried out by private companies in the state forests. In principle, it also concerned private forests, but due to difficulties in supervision it was a dead letter from this point of view (Mäkelä 2005).

Legislation for controlling the utilisation of private forests was under preparation from the turn of the twentieth century. The leading objective of the Law Concerning Private Forests enacted in 1928 was to stop the devastation of young, growing forests. Infringements were punished by prohibiting cutting of the forest holding for a certain period (Mäkelä 2005).

The forest shall not be devastated; hence it shall not be cut, neither must the ground be left in such a condition after cutting nor be used so that the natural regeneration of the forest will be endangered. If a young growing forest is cut in a manner contrary to the principles of rational thinning this too shall be regarded as devastation, as also if a young growing forest is burn-beaten in an area that cannot be considered suitable for cultivation purposes (Suomen asetuskokoelma 161/1928).

The Private Forestry Commission suggested in its report of 1926 that promotion and control of the utilisation of private forests should be carried out by district and municipal forestry boards. The 3-5 members of each district board were to be nominated by the agricultural and economic associations, except for one member, representing forestry expertise, who was to be nominated by the Central Forestry Board. Being well versed in forestry was a precondition for all candidates for the forestry boards, both at the district and municipal level. The task of the municipal forestry boards was to assist the district forestry boards. Cases of infringement were to be settled between the forest owner and the forestry board or else they were to be taken to the circuit or municipal courts as civil cases (Komiteamietintö 1926:2).

The agricultural organisations criticised the double role of the forestry boards, suspecting that farmers could not turn to these boards in confidence to ask advice on the management of their forests, because the same officials also had authority to supervise management of the forests. All the other organisations representing the forestry sector supported the proposed law, however. The fears expressed by the agricultural organisations were viewed as unnecessary remarks among the forestry experts, who maintained that the law laid more emphasis on the promotion of good silvicultural practices than on controlling and sanctioning forest owners. The long-term objective of the law was that the forestry boards would not need to use their police authority (Hakkarainen 1997).

## 2. Objectives and methods

According to the forest legislation, a forest owner had to notify the municipal forestry board before starting to fell trees, but there was no deadline as to how long before felling the notice had to be given. It was the task of the forestry boards to supervise that cuttings and regeneration of the cut areas were conducted according to the law. The main reason behind the conflict between the private forest owners and the district forestry boards representing scientific forest management was related to interpretation of the law. The law concerning private forests was a broad skeleton law, and the actual definition of devastation of a forest depended on the forestry experts.

When the Law Concerning Private Forests came into force the forestry boards interpreted the paragraph regarding devastation of the forests very strictly. The penalty for devastation was the prohibition of cutting in the forest, which meant that the owner had to regenerate the forest holding and manage it according to instructions given by the forestry board. This was known among the local people as "locking the forest", which described the situation well from the point of view of the owner. During the locking period the forestry board controlled not only the "devastated" woodlot but the utilisation of all the forest holdings belonging to the owner. The prohibitions on felling illustrate well the conflict between the traditional and scientific perceptions of forest management. In 1940 almost six per cent of the total area of privately owned productive forest land was closed to cuttings (Suomen tilastollinen vuosikirja 1941, 1942; Metsäkeskus Tapio 1993). In many cases the cause of the "conflict" between the forest owner and the forestry board was a difference in their perceptions of the concept of sustained yield forestry.

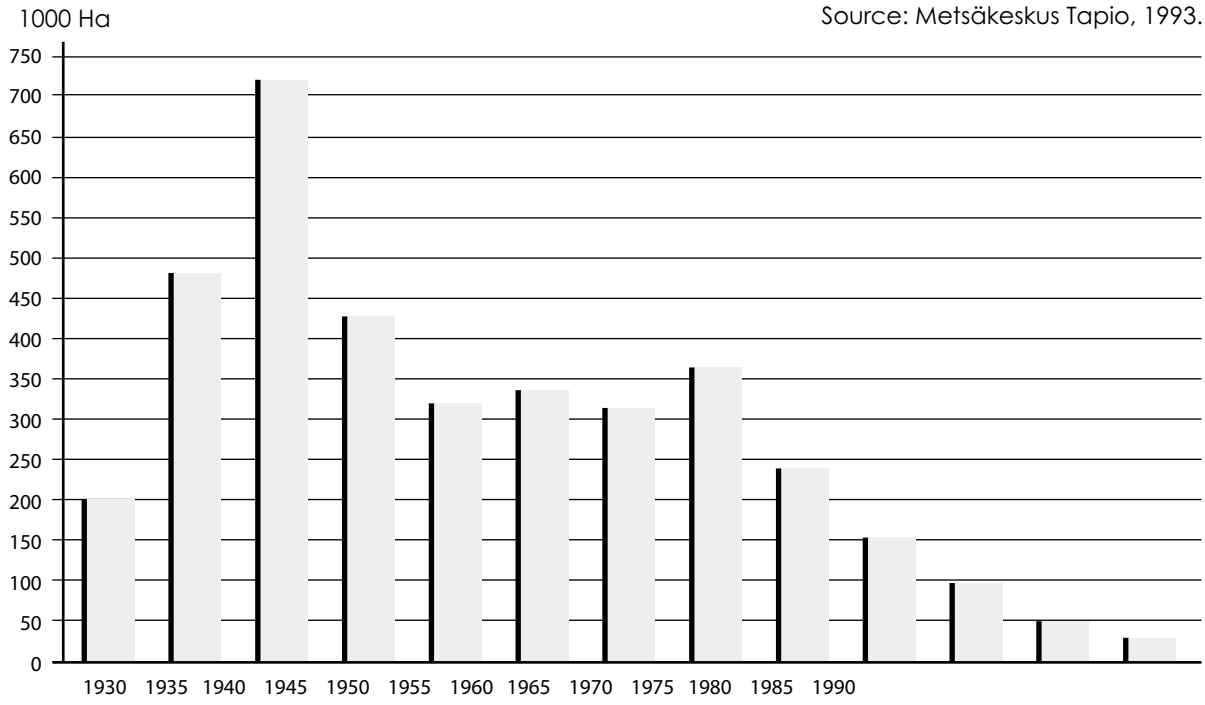


Figure 1. Area of forest holdings closed to cutting, 1930-1990

The objective of this paper is to discuss the adaptation of the ideas of scientific forest management practices to private forestry and the reactions of the private forest owners. The key concepts are forest management by the selection system and devastation of the forest. The "conflicts" between private forest owners and forestry boards were entangled around these concepts and their interpretation throughout the period from the 1920s to the 1980s. The paper tries to understand

and explain why selective cutting has been a dirty word among Finnish forest researchers, with the authorities and later also within the forest industry. It is characteristic of Finnish research dealing with this topic that the forests and their treatment have mainly been approached from the perspective of wood production and the forests have been seen as an economic asset. More than 50 per cent of Finland's forest area was in private ownership throughout the period concerned (Suomen tilastollinen vuosikirja 1941, 1942; Holopainen 1981).

The concept of environmental literacy is used to interpret the arguments presented by the parties to the "conflict". The widely used concepts of traditional knowledge, local knowledge or indigenous knowledge – which have sometimes been used more or less as synonyms – are often seen as being opposed to science and have been considered static. Environmental literacy combines both the perceptions of the local people and those of the forest authorities regarding the management of forests, and more widely their attitudes towards the environment. Dynamism is also characteristic of the concept of environmental literacy, which includes elements of the cultural knowledge transferred from generation to generation and elements of knowledge learned in this case from the forest authorities, for example. In a similar way the forest authorities and scientists can learn from the forest treatment practices of local people (Hares et al. 2006).

## 3. Phases of the "conflict"

### 3.1. Fighting against the selective cutting method

The outcome of the first forest inventory, implemented in 1921-1924, was that due to selective cutting, a great proportion of the cut woodlots were in an underproductive state. Selective cutting had been the method used in an overwhelming majority of the forests where cutting had taken place (81%), and the inventory results suggested that about 27 per cent of such forests had been spoilt or devastated in this way (Heikinheimo 1931; see also Ilvessalo 1927).

The forest authorities firmly maintained that selective cutting was the wrong method to be used in Finnish conditions and would indisputably lead to devastation of the forest. According to the forest scientists, a mature forest should be felled in such a way as to ensure its regeneration either naturally or by means of planting or seeding. In young and middle-aged stands only rational thinning was permitted (Leikola 1986). This meant that the traditionally favoured method of thinning from above could be allowed only in exceptional cases.

The private forest owners had a different perception of sustained yield forestry, however. If selective cuttings were planned and conducted well the forest owner did not have to carry out any final felling or regenerate the forest either naturally or artificially. The problem related to final felling was that the owner did not get any income from the forest for many decades after that, whereas regeneration of the felling area was costly. Another important argument in favour of selective cuttings was the perception of a well-managed forest landscape among farmers. Clear-felled areas suggested to neighbours that the farmer was on the verge of bankruptcy (Hakkarainen 1997). The great number of cutting prohibitions in the 1930s was a reflection of a deep gap between the forest authorities' and farmers' conceptions of what constituted sustainable forestry (Ennevaara 1946).

The dissatisfaction of the forest scientists with the silvicultural state of Finland's forests burst out into the open in 1948, when a group of influential forest researchers published a "Declaration" in Metsätaloudellinen Aikakauslehti, in which they emphasized the destructive impacts of selective cutting on Finland's forests. The article was not directed only at private forest owners

but also at forestry experts, as a reminder that forest management by the selection system could not be accepted und er any circumstances (Appelroth et al. 1948). The recommended methods of forest management were thinning from below, clear cutting and natural regeneration.

In the 1950s the forestry boards strengthened their supervision of cuttings in private forests. Mr. Eero Paatero a forest counsellor working for the Northern Savolax Forestry Board in the early 1950s, recalled that enforcement of the law was very strict. In some municipalities dozens of infringements were recorded annually, and in almost all cases the cause was selective cutting (Kolho and Nenonen 1998). Cutting bans were a widely used means of forcing "dissident" forest owners to "toe the line". In Savolax, as elsewhere in Finland, the number of infringements against the Law Concerning Private Forests began to decrease in the 1960s.

### 3.2. MERA – winning the favour of forest owners with money

The legislation on private forests in Finland was revised in 1966, and in the new laws that came into force at the beginning of 1967 the content of the concept of devastation of the forest was redefined so that the principle of reasonable forest growth was concerned more with the overall management of the forest rather than only the cutting method, as in the previous law of 1928. Another significant revision was that cutting was permitted only after the respective forestry board had accepted the cutting plan and assurance was given – normally in the form of a bank deposit – that the regeneration would be conducted according to the accepted plan. The forestry boards retained their police powers with regard to supervising compliance with the law (Holopainen 1981; Mäkelä 2005).

The expansion of the forest industries increased the demand for round wood by 60 per cent during the years 1955-1970. Building of the new capacity in the wood pulp industries opened desirable markets for small wood that had been a problem between the world wars. Of the many programmes prepared in the 1960s to promote wood production in the Finnish forests the most significant were the series of MERA programmes (1961-1976). The MERA Committee (Forestry Financing Committee) was composed of representatives of the forest owners, the central forestry boards, state forestry and the forest industry. The leading objective of the MERA programmes was to intensify wood production by financing forestry improvement activities in both state and private forests. Private forest owners were supported financially to ditch their mires, fertilize their forests, build permanent forest roads and till clear-felled areas, for example (Holopainen 1981; Parviainen 1994; Eriksson 1993).

An important unannounced objective of the MERA programmes was to commit the private forest owners to supporting intensive forestry and finally put an end to selective cutting. The introduction of new lumbering technology increased the pressure for clear cutting and artificial regeneration. As a whole the MERA programmes meant a rapid transformation from natural to artificial regeneration in private forests.

Despite the promotion of clear cutting and artificial regeneration, there were still many forest owners who trusted in "traditional" methods in the 1960s and 1970s. Hahtola (1967) noted that clear cutting met with social resistance in farming communities, and Järvinen (1977), studying the opinions of private forest owners and forestry experts concerning forestry and its promotion, revealed that the greatest differences of opinion among the forest owners appeared between those belonging to different ownership categories, the non-farmer forest owners generally having a more favourable attitude towards the methods of intensive forestry and its profitability. Järvinen explained these differences in terms of the level of schooling and wealth, which was higher

among non-farmers. Hellström (1989), focusing on infringements of the private forest law in the 1970s and 1980s, supported the findings of Järvinen and Hahtola. Farmers were particularly opposed to the paternalistic attitude of the forestry boards in supervising the implementation of the law for private forests.

An important objective of the MERA programmes was to indicate concretely to farmers that intensive forestry based on clear cutting and artificial regeneration was economically more profitable than forest management by selective cutting. The forestry experts obviously did not want to conceive that forest owners could have another kind of relation to their forest.

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### 3.3. Emphasis on multiple uses of forests

Since the United Nations Conference on the Human Environment in Stockholm in 1972 interest on environmental issues has been increasing. The strengthening environmental movement in Finland paid attention at first to the prevailing forest treatment practices. From the early 1980s onwards, natural regeneration methods and the idea of the multiple uses of forests gained a foothold in forest management once again. At the same time the high costs of artificial regeneration and the uncertainty of its final results created pressures among the forest owners to revise the forest management instructions (Parviainen 1994).

Clear cutting had been openly criticised by environmentalists in the 1970s, but in the next decade the forest owners also joined the front. At the same time some discordant notes also arose from the previously harmonious community of forest researchers and authorities. The most laudable and courageous of these critics was Professor Erkki Lähde, working at the Forest Research Institute. Forest scientists and the forest industry looked on Lähde's continuous forest management method as a parallel to the selective cutting system, so that it was something strictly to be condemned (Lähde 2003; Reunala and Heikinheimo 1987).

In the early 1980s a group of private forest owners openly attacked the forest management practices of intensive forestry. The best-known of these "rebels" was Mr. Reino Takala, who first won his case in the circuit court but was then convicted of devastation of his forest at the Kouvola Court of Appeal. Experts' statements were obtained from influential Finnish forest scientists (Prof. K. Kuusela, Prof. M. Leikola), who considered Takala's forest management method unsustainable (Lähde 2003).

The behaviour of the "rebels" was a reflection of the general discontent with the methods of intensive forestry. Forest owners wrote to newspapers insisting on the restoration of "softer" forest management methods. Meanwhile the growing pressure coming from outside the forest sector compelled the forest scientists, the authorities and the forest industries to reconsider the methods used in forest management. The transfer of emphasis towards the multiple use of forests meant that the content of the concept of devastation had to be reinterpreted. Under the growing pressure, the forest scientists and authorities had to learn flexibility and tolerance in issues related to the management of forests.

## 4. Discussion

The forest sector has played a crucial role in Finland's national economy right up to the present time. During the first decades of independence, in the 1920s and 1930s, more than 80 per cent of the country's export income came from forest products (Suomen tilastollinen vuosikirja 1941, 1942). Although it was justifiable to speak of the forests as national property in an economic sense, more than half of Finland's forest area was in private ownership and there was a great difference in the environmental literacy between the private forest owners and the forest scientists and government authorities in terms of their perceptions of sustainable forest management.

It was characteristic of the environmental literacy of the forestry experts up to the 1980s that the forests were seen strictly as a source of income, and this was reflected in silvicultural practices. The leading objective of forest management was to maximize the economic benefit that could be gained from the forests on sustainable basis. The forest authorities failed to recognise the needs of the private forest owners, or were not willing to do so. The powerful tool that the forestry boards possessed for implementing their national project was the forest legislation, which could be interpreted

in many ways, and, supported by the forest scientists, they were inclined to adopt the strictest interpretation of the law, which the forest owners felt to be paternalistic. The "traditional" style of forest management, employing the selection system, had enabled the private forest owners to derive a continuous income from their forests without any need for regeneration. The forest owner enjoyed the appreciation of his neighbours if his forest seemed to be full of timber instead of containing artificially regenerated clear-cut areas.

The forest authorities and scientists used the forest improvement acts, the first of which was introduced in the early 1930s, to promote their aim of increasing wood production in the Finnish forests. Connected to their strict interpretation of the private forest law, this enabled the forest sector to achieve its goal, but it went too far in the intensification of forestry. The "rebellion" against intensive forestry in the early 1980s was a clear reflection of the need to take the forest owners' environmental literacy into account in forest management as well.

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## Problems with the practical implementation of laws regarding the traditional knowledge of indigenous peoples in Russia

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### Abstract

The national state forests of the Russian Federation cover 1,114 million hectares, or 70% of the national territory, and include forests of several different types. Russia's history demonstrates that traditional knowledge has been one of the most important elements of indigenous peoples' livelihoods. Traditional knowledge is concentrated in Russia's Arctic territories, Siberia, the Russian Far East, and a few territories of the Russia's North Caucasus in the Republic of Dagestan. For example, the main practices of the Northern indigenous peoples, which are based on traditional knowledge, are reindeer breeding, hunting, fishing, harvesting of native plants and herbs, and feedstock gathering. In the post-Soviet period the government declared that efficient forest policy should be based on a long-term national strategy for forest resource development. The Forest Code clearly states the government's authority to own the national state forests and to regulate its use. In line with its official status as the regulator of forest use, the government must exercise its duties to achieve effective use of forest resources, securing a balance of interests and an equal share of benefits between all the participants, including local indigenous peoples. However, the fundamentals of forestland ownership are still not clear and are under discussion. While no forestland can be private, according to the previous legislation, the new legislation (operative since November 1, 2004) allows forestland concessions, long-term rent and other kinds of forestland use. As a result, any new forestland owner has the right to restrict or forbid indigenous peoples' use of traditional knowledge or practices on their territory.

In order to foster and promote the participation of indigenous peoples in sustainable forest use, the government could attract them or their representatives to participate in the implementation of environmental programs, environmental legislation on enforcement, and environmental impact assessment; submit restrictions on non-traditional practices for their approval, and so on. Obviously, all the norms concerning environmental protection that regulate the activities of indigenous peoples and their communities should be specified in the laws and acts which determine the legal regime of the Territories for Traditional Use of Nature. Some Russian experts and governmental officers support and promote this idea. The concept of a "Territory for Traditional Use of Nature" may help to attract traditional knowledge into sustainable forest management. There are problems with implementation stems from the declarative character of the Federal Law Guaranteeing Indigenous Peoples' Rights in the Russian Federation (April 30, 1999). In many cases the Law does not offer mechanisms to enforce indigenous rights – such as the right to traditional knowledge – but only gives a statement of principles. Therefore, these rights, though guaranteed in the law, are not enforced. There are conflicts between the authorities of indigenous peoples and a government body frequently means that no legal regime can be established to guarantee indigenous peoples' rights and protect their interests. In addition, the functions of authorities of federal, regional, sub-regional and local administrations are often duplicated. Also, new legislative measures on indigenous peoples' rights often guarantee rights that are already guaranteed as common rights to all Russian citizens. Thus, given the fact that indigenous peoples are citizens of the Russian Federation, the reason for specifying these rights in new documents is not clear.

# Theme 3. CONSERVATION OF CULTURAL LANDSCAPES

## Biocultural heritage – the missing link between culture and nature?

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### Abstract

Today there is a general consensus among scientists that almost all nature is, or has been, more or less strongly influenced by man. With respect to agriculture land, cities, infrastructure landscape, industrial landscape and most forests in industrialised countries this has indeed been the case for a long time. Still in the last decades there has been a tendency, especially concerning forest areas, to underestimate or even neglect human impact on what we in daily language call "nature". One main obstacle is that the competence is often scattered between several institutions and authorities handling nature and culture respectively, and in many cases also different legislations, different economic resources and so on. This has meant difficulties in sharing the wide knowledge which is available from research and specialised inventories and to effectively integrate cultural aspects in forest conservation and management. As a consequence, conservation and restoration work in the forest landscape is not as sufficient or as good as it could be.

Another problem is the, so far, limited and unsystematically use of our rich amount of historical sources. It is of course impossible to evaluate and make correct management plans for different cultural values in the forest if you don't know their history. How and when were they established? For what purpose and in which wider context did they exist? How were they managed? Which were the main conditions for their continuous existence and which were the main threats? Systematic studies of the rich source material can often answer these questions to an acceptable degree. Especially important are the so-called "Large-scale digitalized Historical Maps."

In order to make the obvious inseparable interaction between natural conditions and processes and cultural conditions and processes respectively more obvious and precise the National Board of Forestry in 1999 (Since 1st of January 2006: Swedish Forest Agency) coined the concept "Biocultural Heritage". The authority considered that it might develop into the necessary but so far missing link between nature and culture for scientists and conservation authorities. In Sweden this process has started and we now see it advancing further. A main purpose with the Concept Biocultural Heritage is to focus on traditional knowledge, to increase the use of it and to make the authorities and researchers involved to co– operate more regularly and efficiently. Such a process would mean a considerable advantage and progress for the work with sustainable management of the cultural heritage in the forest.

The concept of "Biological Heritage" was presented and discussed at the MCPFE Con Forest and our Cultural Heritage-conference in Sunne in June 2005. The Biocultural Heritage Concept was included in the conclusions and "recommendations of the Conference. I consider my paper as a natural follow up of the "seeds sown" at that Conference. The objective with my paper is to give a broader and deeper description on "Biological Heritage" and to show how the use of traditional knowledge can contribute to a better management and conservation of cultural heritage in the forest. It will also promote continued discussion of the Concept "Biocultural Heritage"by providing the Swedish view and experiences. We hope there will be a consensus on the European level and that such a consensus will lead to a wider co-operation between different European countries on the subject. The paper will mainly present the following conditions:

- How is the concept "Biocultural Heritage" defined in Sweden. Should this definition be refined or widened?
- Is there really a need for this new concept? Is there a risk for confusion rather than clarification?
- Which are the possible advantages?
- How can it contribute to a better management and conservation of the cultural heritage in the forest?
- How can it contribute to a better co-operation between different researchers and relevant authorities involved?
- How can it be put into theoretical and practical use?

Although these questions have been discussed by relevant actors in Sweden some the questions still remains.

## Studying land use history to support ecosystem management – a case study on changes in forest use in the Swiss Alps

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### Abstract

Most regions, landscapes, and ecosystems are anthropogenically modified, i.e., show traces of human impact, which can be interpreted as anthropogenic disturbances. Understanding the dynamics of the relationship between people and ecosystems requires an interdisciplinary approach, combining ecological as well as historical research. Historical ecology utilizes epistemologies drawn from both the social and physical sciences and in particular combines methods and approaches from ecology, history, ethnography, and geography in varying degrees of preference depending on the central research question. Three main applications of historical ecology are distinguished: a.) the preservation of cultural heritage, b.) the assessment of ecosystem change, and c.) the support for ecosystem management. Specific and precise information on human impacts on ecosystems, i.e., anthropogenic disturbances, is needed for all three dimensions of historical ecology. In our paper, we illustrate these three dimensions at the example of changes in forest use in the upper Swiss Rhone Valley (Canton of Valais) for the last 150 years.

Our study reveals, that several traditional non-timber forest uses, such as wood pasture and forest litter collecting, have been practiced up to the mid 20$^{th}$ century. Consequently, the traditional knowledge, connected to these forest uses is about to disappear. Based on various source types – oral history proofed to be especially valuable –, we collected information on management practice, but also the spatiotemporal patterns of these traditional forest uses, which we consider to contribute to the preservation of cultural heritage. As a contribution to the second dimension of historical ecology mentioned above, we assessed the ecological impact of wood pasture and forest litter collecting. These anthropogenic activities have to be seen as anthropogenic disturbances for the forest ecosystems affected. Precise information on the respective disturbance regimes are vital to asses their impact. We quantified the respective biomass export based on information on the context, in which the use was conducted, e.g., animal husbandry, availability of alternative resources, etc..

These quantifications illustrate, how deeply present day forests are shaped by past land use. Today, forests in the study area are undergoing rapid changes, i.e., forests dominated by pine show high rates of mortality and are increasingly replaced by oak stands. Ecosystem management has to be based on information about the natural as well as the anthropogenic disturbance regimes and their changes over time. Therefore, the reconstruction of the disturbance regimes caused by wood pasture and forest litter collecting is not only of ecological relevance, but also a crucial piece of information for the forest managers.

The paper concludes by discussing how historical ecology can be developed in the future to specifically foster its application in the three main fields mentioned, and consequently to further strengthen its significance for science as well as for practice.

**Keywords:** historical ecology, ecosystem management, woodland history, Central Europe, wood pasture, litter collecting, anthropogenic disturbances.

# I principali sistemi di uccellagione con le reti fisse: storia, tecnica e paesaggio

# The main bird-catching systems with fixed nets: history, techniques, landscape

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## Abstract

Bird-catching refers to techniques used to catch small birds without the use of rifles. This traditional knowledge dates back to Roman and early medieval times. The authors have carried out a detailed investigation on the most common practices used to capture bird with small nets, used mostly for migratory birds. These practices involved the establishment of systems called "roccoli", "paretai", and "brescianelle", usually made by planting hedges and trees according to a scheme that permits fixing nets on them. In many cases, the number and the location of such systems, placed on mountain top or mountain passes, create specific landscape patterns that looks like "Italian gardens". Many of these systems, used today mostly for scientific purposes, requires a large number of operations and management forms, knowledge has been traditionally transmitted orally from one generation to the next. Some of these structures are today officially recognized as "national monuments". Together with a detailed description of some typologies, conservation techniques are also proposed in order to prevent the loss of a cultural heritage which has its roots in the past millennia.

## 1. Premessa

L'uso delle reti per la cattura della selvaggina risale alla più remota antichità ed è continuato sino quasi ai giorni nostri con alterne fortune. Con le reti i Romani catturavano ogni specie di selvatici, dalle grosse fiere destinate ai sanguinosi giochi del Circo, ai piccoli uccelli (aucupio) per le favolose mense del patriziato. Famosi sono i consigli di Lucullo per ingrassare gli ortolani (*Emberizia hortulana, L., 1758*), catturati con reti e mantenuti in voliere dove venivano alimentati con fichi secchi tritati mescolati con farina d'orzo, prima di finire sullo spiedo o in casseruola, per alcuni piatti ritenuti dai Romani dell'epoca Imperiale il massimo della raffinatezza.

Nel Medioevo, per proteggere la selvaggina "nobile" riservata alla falconeria, l'impiego delle reti da parte del popolo minuto venne alquanto limitato (Perosino, 1960). Già nel secolo XIII abbiamo menzione di vari metodi di aucupio da parte del giudice bolognese Pietro De Crescenzi (1233-1321) che, nella sua opera *Liber ruralium commodorum,* dedica a questo *argomento un capitolo intero: come gli uccelli con rete si pigliano*.

Nel Seicento, con gli scritti di Giovan Pietro Olina (1622), l'aucupio diventò una vera e propria arte anche per i sistemi di cattura con le reti fisse, cioè non spostabili da un luogo all'altro, data la complessità dell'impianto. Copertoni e paretai appaiono infatti già ben delineati nell'opera del suddetto

autore che pertanto può venire considerato il "padre" delle moderne tecniche di uccellagione. Un ultimo decisivo contributo lo si deve infine ad Arrigoni Degli Oddi, illustre ornitologo bolognese ed appassionato cacciatore, vissuto tra la fine dell'Ottocento e la prima metà del Novecento. Con le sue numerosissime pubblicazioni, egli conferì alla caccia con le reti quasi la dignità di scienza, codificando e perfezionando tecniche venatorie ormai millenarie. La legge "stralcio" (n. 799 del 1967), cancellò di fatto tali antichissime tradizioni, proibendo l'uccellagione che poi, nel 1970, venne reintrodotta, con un apposito emendamento, in limitatissimi casi e per la cattura degli uccelli da inanellare a scopo scientifico.

Oggi tuttavia sembra che, anche per questi particolari fini, l'uccellagione, nelle forme più classiche, sia destinata ad essere definitivamente bandita. Ciò significherebbe, oltre alla perdita di un patrimonio culturale che affonda le sue radici nella storia della nostra civiltà, lo smantellamento di alcuni impianti di cattura vecchi di secoli, molti dei quali considerati veri e propri "monumenti nazionali". Il lavoro vuole pertanto richiamare l'attenzione sui principali sistemi di aucupio con reti fisse (bresciana, roccolo, paretaio) in modo che una migliore conoscenza dell'argomento permetta di salvare gli impianti più rappresentativi e con essi il paesaggio forestale modellato dall'uomo per consentire il loro funzionamento.

## 2. Brescianella (bressana o bresciana)

E' derivata dal roccolo; si può considerare il più moderno mezzo di aucupio e viene usata soprattutto in pianura o lungo i crinali collinari, purché con scarse pendenze del terreno (figura 1).

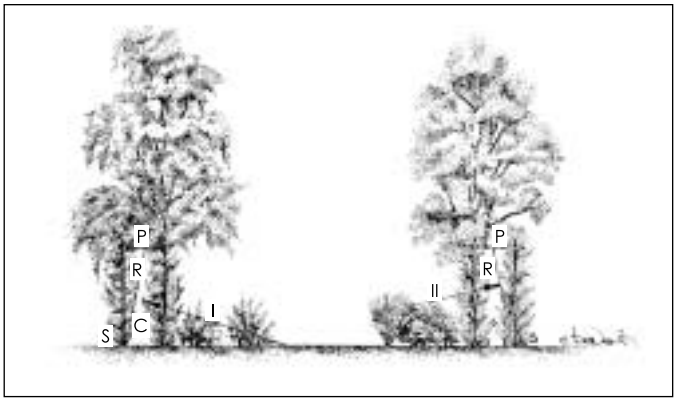


Figura 1.
Sezione di una brescianella:
C. corridoio; P. palo di armatura per sostegno della rete; R. rete; S. siepetta; I, II, direzione del volo degli uccelli sotto l'azione dello spauracchio.

Ha la forma di un rettangolo con i due lati maggiori lunghi il doppio della larghezza; la lunghezza totale varia dai 70 ai 120 metri, l'altezza delle alberature da due a quattro metri. Il corridoio alberato perimetrale, che la chiude in ogni sua parte e che porta e nasconde la rete disposta verticalmente, è formato da due file parallele di carpini poste alla distanza di circa un metro e mezzo l'una dall'altra. Nei due filari si ritagliano, con paziente e metodica potatura, degli ampi finestroni ad arco che serviranno di invito agli uccelli verso la rete verticale (Arrigoni Degli Oddi, 1926).

Il terreno circoscritto dal corridoio risulta suddiviso in tre settori, ciascuno dei quali ha una diversa finalità. Il settore che si trova in fondo, nella parte opposta al casello (dove si nasconde l'uccellatore), è seminato a prato e prevede la presenza di ginepri, biancospini, ligustri e ontani: tutte piante che producono frutti appetiti da tordi, merli, tordele e cesene. Queste piante vengono tenute a un'altezza massima di un metro e mezzo per evitare che gli uccelli, posatisi troppo in alto, sfuggano all'azione dello spauracchio. Nel settore centrale il terreno è asciutto, coperto di sabbia, e vi vengono coltivati miglio e panico, allo scopo di attirarvi verdoni, fringuelli e frosoni che sono ghiotti di tali semi (Ghidini, 1935). Il terzo settore, cioè quello più vicino al casello, viene mante-

nuto a prato e può ospitare piante, come salici e olmi, adatte a specie di uccelli con scarse esigenze (passeri, cardellini, lucherini ecc.).

Nel mezzo della brescianella, in senso longitudinale, corre un filo metallico, al quale sono attaccati gli spauracchi. L'estremità inferiore del suddetto filo viene legata alla pianta centrale del corridoio (o pergolato) opposto al casello, mentre quella superiore viene fissata ad un palo a leva, governato all'interno del casello stesso a mezzo di un tirante di corda.

L'uccellatore, appena qualche uccello dalle piante disposte sulle piazzole interne si posa al suolo o fra gli arbusti, tira la suddetta corda in modo da fare alzare il filo dello spauracchio molto al di sopra del pergolato. Gli uccelli sono così obbligati a fuggire in linea orizzontale o verso il basso e, cercando scampo attraverso i finestroni del corridoio, incontrano la rete che, per l'urto violento, farà sacca e li terrà prigionieri.

Tali reti, dette a tramaglio, risultano composte, secondo Arrigoni Degli Oddi (*op. cit.*), da una rete mediana a maglia relativamente piccola, da 15 a 30 mm di lato, e da due reti laterali che la racchiudono. Queste ultime hanno maglie larghe da 230 a 260 mm e formano la cosiddetta armatura, che ha lo scopo di sostenere la rete mediana a maglia fitta e facilitare la formazione delle sacche nel momento in cui gli uccelli vi urtano contro.

Le tre reti vengono fissate in alto ad un cavetto che percorre il corridoio per tutta la sua lunghezza, tramite anelli; in basso vengono ancorate ad una semplice cordicella, a sua volta fissata a un filo di ferro, parallelo al cavetto, che mantiene in tensione la rete della bresciana.

Il tramaglio presenta un'altezza che varia da 2 a 3 m; viene teso obliquamente verso l'esterno, lungo tutta la galleria formata da carpini, e mantenuto fermo, sia in alto che in basso, da due fili di ferro. Quello superiore (cavetto), è agganciato ai travicelli formanti l'armatura in legno del corridoio o pergolato, quello inferiore è fermato con uncini conficcati nel terreno o con pesi di cemento.

La struttura del casello risulta assai semplice e le suppellettili ridotte all'essenziale. Nella maggior parte dei casi consta di tre parti: il piano terra, nel quale vi è la camera per il ricovero notturno degli uccelli da richiamo, che serve anche da ripostiglio per i vari strumenti venatori; il primo piano, nel quale è dislocata la camera dell'uccellatore; il ballatoio, una veranda, per lo più in legno, senza finestre, ma dotata di una feritoia larga circa 5 cm, detta "visiera", che serve per vedere quanto avviene nell'uccellanda. Nel ballatoio si trovano la corda di comando dello spauracchio (il cui meccanismo è istallato sul tetto), i capi delle cordicelle collegate agli zimbelli e quella dello "schiamazzo". Secondo Puccioni (1938), lo schiamazzo è un tordo bottaccio tenuto in gabbia e che si fa "schiamazzare" mostrandogli una civetta in modo che i tordi in volo accorrano al grido d'allarme (*mobbing*).

Il casello viene unito alla bresciana tramite un corridoio di frasche, per dare la possibilità all'uccellatore ed al personale di servizio di muoversi senza essere veduti; inoltre è quasi sempre nascosto da rampicanti che lo coprono fino alla visiera. Gli uccelli da richiamo, tenuti in gabbia, necessari per il funzionamento della bresciana, sono in genere molto numerosi (circa un centinaio) e vengono disposti nell'impianto secondo tecniche particolari.

La zona circostante la brescianella, viene mantenuta a pascolo o investita con colture erbacee a perdere (girasole, frumento, sorgo ecc.). In caso vi siano dei boschi di latifoglie, questi vengono governati a ceduo con turni brevi, ma senza lasciare matricine che, a causa della loro altezza potrebbero "competere" con le alberature della bresciana. Inoltre viene mantenuto spazio fra le ceppaie così da favorire, nei primi due o tre anni dal taglio, la vegetazione di erbe spontanee, i cui semi risultano particolarmente appetiti dai piccoli Fringillidi (cardo dei lanaioli, trifogli, tamaro, stroppione, erba morella, *Setaria* spp., *Cardus* spp. ecc.).

## 3. Roccolo

Sembra che il roccolo (rocolo nell'antichità) abbia avuto origine alla fine del XVI secolo; notizie dettagliate dell'impianto e della tecnica di cattura si riscontrano già nella importantissima opera dell'Angelini (1725) intitolata: *La descrizione dell'uccellatore col roccolo* (cit. da Ghidini, 1935).

Al contrario della brescianella, il roccolo viene impiantato di preferenza in collina o in montagna, su un terreno declive, con il casello in posizione elevata per rendere più facile all'uccellatore il lancio dello spauracchio (figura 2).

Figura 2.
Alcuni impianti particolarmente curati sono stati dichiarati monumento nazionale e sono tutt'oggi in funzione per consentire catture a scopo scientifico (Foto Calegari, 2002)

Ha quasi sempre forma rotonda o a ferro di cavallo; il corridoio di carpini, o di altre latifoglie, e la rete si differenziano da quelli della brescianella soltanto nell'altezza, che nel roccolo raggiunge i 4-5 metri. L'interno è formato, a differenza della bresciana, da un boschetto di alberi ad alto fusto (querce, faggi, betulle, ciliegi, robinie, sorbi ecc.) disposti in modo che l'albero al centro risulti il più alto e s'innalzi al di sopra del corridoio per non più di un metro e mezzo; gli altri vanno lentamente e gradatamente diminuendo d'altezza fino a raggiungere il livello del corridoio stesso (Gioli, 1912, Arrigoni Degli Oddi, *op. cit.* 1926, Ghidini, *op. cit.*, 1935).

Il terreno sottostante agli alberi viene tenuto a prato, mentre il casello differisce da quello della brescianella per la posizione del piano dove sta l'uccellatore; quest'ultimo deve trovarsi sempre in posizione più alta delle piante del roccolo in modo da lanciare agevolmente lo spauracchio. Quando gli uccelli migratori, attirati dal canto dei richiami, si posano sugli alberi centrali, l'uccellatore lancia improvvisamente lo spauracchio suddetto, formato da bastoncelli con all'estremità un tondo di vimini intrecciati, o delle sporgenze di latta, così da simulare la sagoma di un falco in volo.

Gli uccelli impauriti fuggono verso il basso cercando scampo attraverso i finestroni del corridoio, dove incontrano la rete a tramaglio che li imprigiona.

Completano l'impianto le cosiddette passate (Tirabosco, 1988); si tratta di reti complementari, disposte verticalmente, che servono per catturare i migratori che sostano nei boschetti situati al di fuori della bresciana o del roccolo. Gli uccelli incappano nelle passate senza esservi spinti da spauracchi, volando di pianta in pianta, oppure da terra per posarsi sugli alberi.

Anche il roccolo necessita di numerosi richiami le cui gabbie, durante la caccia, vengono in genere appese agli alberi del boschetto centrale.

Appare evidente come la differenza sostanziale tra brescianella e roccolo, risieda nella diversa direzione del volo con cui gli uccelli incappano nel tramaglio per sfuggire al "falco".

Nella brescianella, tipico impianto di zone pianeggianti, i migratori vengono spaventati quando si trovano a terra o sugli alberelli posti all'interno dell'impianto: pertanto urtano le reti con direzione di volo dal basso verso l'alto.

Nel roccolo invece si utilizza la pendenza del terreno per cui, di norma, lo spauracchio viene lanciato al di sopra degli alberi del boschetto in modo che gli uccelli, per evitare l'attacco del falco simulato, cerchino scampo volando dall'alto verso il basso attraverso i finestroni del corridoio, dove si trova il tramaglio.

In molte zone dell'Appennino centro settentrionale e delle prealpi, dove esistevano fino al 1967 numerosi roccoli, si possono osservare ancora oggi curiosi gruppi di alberi isolati che ornano la cima dei valichi o dei costoni più alti: sono ciò che rimane dei boschetti e delle alberate. Alcune volte si notano ancora il corridoio a "ferro di cavallo" e il casello: piccola torretta in pietrame, la cui origine appare del tutto misteriosa a coloro che non conoscono queste vecchie tecniche di aucupio. Anche i cedui circostanti presentano tracce dell'antica attività venatoria come gruppi di ontani, di ciliegi, di sorbi, di nespoli comuni ecc., piantati per attirare gli uccelli migratori.

## 4. Paretaio

Il paretaio, o copertone, costituisce il tipico appostamento, con reti orizzontali, per l'uccellagione nelle zone prative pianeggianti e sulla sommità di qualche poggetto disalberato, in collina o in montagna. E' formato da due grandi rettangoli di rete comune (non tramaglio) di lino o cotone, detti appunto "copertoni" o "paretai", di colore scuro, con maglie larghe 15-16 mm. La lunghezza delle reti varia fra 10-25 ed anche 30 m mentre l'altezza oscilla tra i 2,5 e 3 m (figura 3).

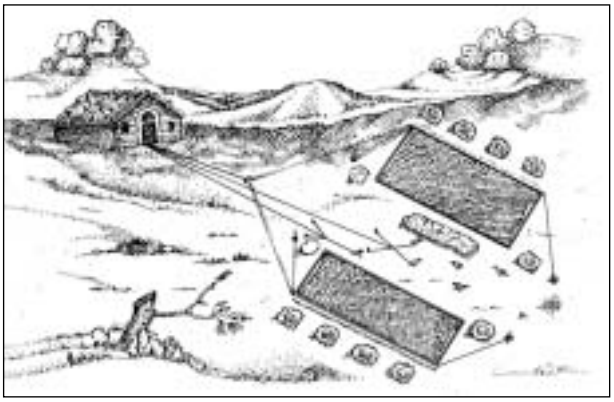

Figura 3.
Schema di un paretaio
(da Olina, modificato, 1622)

Il paretaio si configura come la tecnica di aucupio più economica sia per quanto riguarda l'impianto sia per la manutenzione. La toponomastica conferma come, in genere, ogni podere mezzadrile avesse il suo paretaio, gestito anch'esso "a metà" fra concessionario e coltivatore diretto. La massima concentrazione di questi impianti di uccellagione si trovava sull'Appennino Tosco-Romagnolo dove si raggruppavano circa l'80% di tutti gli impianti della Toscana. Anche questi ultimi sono stati vietati con la legge "stralcio" del 1967; esistono ancora alcuni paretai funzionanti adibiti a centro di cattura e inanellamento per lo studio delle migrazioni.

A differenza della bresciana e del roccolo, le reti del paretaio vengono mantenute sdraiate sul terreno (orizzontali); scattano in alto, ruotando lungo il lato maggiore mediano incernierato al suolo, a comando dell'uccellatore che, con una leva, provvede a sganciare le molle collegate ai due sostegni (aste) disposti lungo il lato minore delle reti stesse. Questi, ruotando di 180 gradi attorno a perni disposti sullo stesso asse del lato mediano fisso a terra della rete, trascinano in alto il lembo libero fino a ribaltarlo sul terreno limitrofo (Olina 1622, Arrigoni Degli Oddi, 1926). Il lato maggiore di ogni rettangolo è munito di anelli che collegano la rete al filo di ferro tendirete, teso fra l'estremità superiore delle due aste del giuoco. Lungo il lato maggiore interno corre una semplice cordicella che serve a tenere la rete fissa al terreno, per mezzo di cavicchi di legno fatti a uncino e posti a distanza

fra di loro di 40-50 cm. I suddetti due rettangoli di rete sono montati su quattro pali (due per ogni rettangolo) detti "aste": anteriori quelle poste vicino al capanno e comandate dalle molle, posteriori quelle più lontane che vengono "trascinate" dalle prime.

Il "campo" o "giuoco", situato in mezzo alle due reti, viene preparato in modo diverso a seconda delle specie di uccelli da catturare. All'interno del giuoco si trova anche un boschetto d'invito, alto non più di un metro e lungo circa 10, composto da carpini e faggi accuratamente potati (Ghidini *op. cit.*, 1935). Lo spazio fra l'una e l'altra rete viene occupato da stampe e da richiami in gabbia disposti intorno al boschetto, mentre gli zimbelli vengono posti fra le reti ed il capanno in modo da non venire coperti quando le molle azionano le aste.

Il capanno, dove trova rifugio l'uccellatore, di solito rudimentale e di legno, deve essere ben coperto da frasche; la sua pianta è rotonda, esagonale od ottagonale, per il fatto che normalmente ha disposte innanzi a sé diverse coppie di copertoni il cui numero può variare da un minimo di due ad un massimo di sei. Al capanno stesso (che è quasi sempre a livello della terra) fanno capo gli spaghi degli zimbelli e i cavi che servono per fare scattare le reti così da chiudere, al momento voluto, gli uccelli che si trovano in pastura nel "giuoco" o posati sul boschetto.

## 5. Conclusioni

Anziché determinare la scomparsa degli impianti descritti, ci sembra più opportuno conservare i migliori come vere e proprie testimonianze di un'evoluzione tecnica e culturale che dal Medioevo è giunta fino ai nostri giorni. Conservazione che però preveda anche il loro funzionamento in quanto, risultando costituiti da boschetti ed alberature, devono venire potati e curati ogni anno in modo che la macchia non cancelli queste "sculture nel verde" nell'arco di poche stagioni.

Forse la migliore destinazione degli ultimi roccoli, paretai e bresciane, consiste nell'utilizzarli per lo studio dei flussi migratori mettendo a punto una metodologia di cattura che consenta l'elaborazione statistica dei dati raccolti.

Uno dei maggiori problemi da risolvere per rendere razionale l'attività venatoria a carico degli uccelli migratori ed anche per verificare l'efficacia di determinate scelte di gestione dell'ambiente, consiste nel valutare le variazioni del flusso migratorio delle popolazioni ornitiche più comuni; variazioni registrabili con la metodica cattura ed inanellamento degli uccelli nel corso degli anni, perché ogni popolazione in genere mantiene nel tempo gli stessi percorsi. Si potrebbe così organizzare una rete di osservatori, coordinati a livello regionale, in grado di fornire tutta una serie di dati su un fenomeno, le migrazioni, ancora poco conosciuto sotto l'aspetto dell'incremento o decremento delle popolazioni in transito.

Per avere notizie con un minimo di attendibilità, occorrerà tuttavia attendere almeno una decina di anni; tempo tutto sommato modesto se paragonato all'"età" di alcuni roccoli le cui alberate racchiudono diversi secoli di storia.

Da ricordare infine come gli impianti ancora in funzione dispongano di serie storiche di dati e come la loro chiusura comporti una perdita notevole per lo studio delle migrazioni.

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# The role of pine forests for shaping Korean traditional cultural landscape

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## Abstract

Korea's pine(*Pinus densiflora*) forests have been not only a versatile economic resource but also an important element of cultural landscape in the country over 1,000 years. Pine forests have been around the capital city, Buddhist temples, Confucian buildings, and residences of scholars in Korea. They also appeared around royal tombs and burial grounds of commoners. In addition to an important source of supply for agricultural implements, pine forests have been a symbol for Korean cultural identity. No other tree species have ever influenced mainly agrarian country than pine tree in the history of Korea. Among over 1,000 native tree species, pine was by far the most significant raw material for building palaces and warships, and commercial fleets, and high quality energy source for producing pottery and sea salt. Parts of pine trees were eaten for famine food and used for traditional medicine. As it was such an indispensable materials to support agrarian Korean society at the time, Chosun Dynasty (AD 1392 – 1911) government enacted 'Pine Protection Law' and enforced it over 500 years to successfully protect pine forests across the country. Commoners at each village formed Songgye, a voluntary pine forest trust, to manage pine forests around their communities sustainably. Traces of such traditional forest management practices by government law or village volunteers still can be found in *Anmeondo* and *Bosung* respectively. Such materialistic influence of pine forests in agrarian Korean society developed to profoundly influence even spiritual world of Korean ancestors, who invented symbols of universe, life, longevity, integrity, fidelity, unworldliness, and elegance from pine trees and forests. Pine became popular topics for Korean literature, arts, religion, philosophy, and customs and established a symbolic system of its own. Combined with Korean cultural climate, the symbol that pine trees and forests represent established itself as an essential element of Korean cultural landscape, which has nourished Korean psyche and mind. Pine trees and forests incorporated into Confucian, Buddhist, and Zen philosophies, became an element of Korean identity, and shaped Koreans spiritual world. Even today's industrialized environment, pine trees are planted around monumental buildings, in city's green spaces, along the historic streets so that they still play an active role for shaping the cultural landscape around the country. The best example of this would be pine trees planted in the front yard of *Cheongwadae*, presidential office and residence in Seoul.

## 1. Introduction

Pine forests in the South Korea have shrunk by 40% for the last 40 years through climate change, insect and disease infestation, replacing unwanted species with indigenous species, ecological succession and forest fires. Today pine forests have reduced to only 23.5% of total forested area in South Korea (Korea Forest Service, 2006). This rapid decrease of pine forests has caused the decline in traditional landscape that had existed in various forms such as windbreaks, riparian forests and scenic forests around villages. One promising sign among many negative changes is more pine trees being planted along the streets, in parks and for landscaping works. Another encouraging sign is that recognizing the importance of traditional cultural landscape, government and citizens groups started joint efforts through various campaigns to protect pine trees and forests for a living cultural heritage (Chun, 2005). In this paper, we would like to summarize how pine trees and forests have

become the symbol of life, eternity and integrity in agrarian society of Korea, and some examples of pine forests developed into traditional cultural landscape will be introduced. Also mentioned in this paper is the reason why pine forests are most beloved cultural landscape to Koreans with a few examples.

Figure 1.
View of a *Pinus densiflora* forest in Daekwanryoung (Gangweon-do, S. Korea). Pine tree is a native species in Korea that is covered 1.6million ha, one fourth of total forest area in South Korea.

## 2. Pine Trees as a Symbol of Korean Culture

Pine trees are essential natural resources to support agrarian culture in Korea. Koreans still remember in this industrialized world that Koreans are born with pine trees, live in the pinewoods, and buried in the pine forests behind the village. Maybe this is because of the fond memories held by middle and older generations; they started their lives with pine twigs that were fixed in the *geumjul* (sacred straw rope) in front of their front doors to protect the mother and newborn child from the access of outsider. Koreans built home with lumbers from pine trees, farming implants and even coffins from the same trees. Korean culture is often called pine culture because of this materialistic versatility pine tree has (Chun, 1999).

### 2.1. Role of Pine Tree in Agrarian Korean Society

No tree has ever been such a driving force to the development of civilization as pine trees in Korea. It is almost impossible to think of buildings such as old palaces and temples without pine trees. Contribution of pine trees to Korean civilization does not stop there. It helped to keep people and goods moving around the country and overseas. Not only turtle gun ships that efficiently sunk Japanese's warships but cargo ships transporting rice and salt were also made out of pine trees. World famous white porcelain from *Chosun* Dynasty was also made possible because of special firewood called '*youngsa*' from pine trees. Pine forests especially along the coastal regions helped large amount of sea salt production. So pine tree has made excellent material for construction, shipbuilding, firewood, medicines and famine food in old Korea. Among over thousand trees growing in this country, pine tree provided most benefits to our ancestors. So precious and essential for agrarian Korea, pine trees were regarded as tree of life and have been managed and protected at national level by special laws called 'Pine Protection Law' for over 500 years. But also at community level, each village formed its own '*Songgye*', an organization equivalent to community forest society or nature conservancy in western world, sustainable managed the pine forests close to the village leased by the government on long term basis. Nowadays such forests still remain visible in a few areas (Park, 2000). Pine forests in *Anmyeondo* protected by government over a thousand years and a *Songgye* in *Bosung* which has been existing over 200 years are good examples.

## 2.2. Pine Trees Developed into a Symbol of Korean Culture

This kind of materialistic virtue of pine influenced immensely even on the psychological world of our ancestors. The symbols of universe, life, longevity, integrity, principles, saintliness, and elegance drawn by our ancestors inside their minds were created and developed by pine trees. Pine trees, naturally being integrated into Korea culture, art, religion, ideology, and customs, melted into one symbolic system. Through this symbol system, which originated from the pine tree, brilliantly combining with the natural features of Korea's landscape, it nourished Korean psyche and emotion.

The sphere of influence of pine tree that melted into Korean literature, art and symbols of our ancestors was greater than any other trees. Pine trees were portrayed as tree of life that appeared most frequently in classic Korean poems in Chinese letters, songs, and landscape paintings. Without needing to refer directly to the pine tree inside *Irworoakdo* or *Sipjangsaengdo*, the pine tree, which infused folk religion, *feng shui* principles, Confucianism and Buddhism, and Zen philosophy, became one element of our national identity and continues to guide our conscious world to this day (Chun, 2004).

Figure 2.
Pine tree as the symbol of longevity are presented with sun, mountains, water, stones, clouds, the herb of eternal life, cranes, turtles, and deer. The Ten longevity symbols are a manifestation of the human desire to live eternally without ageing.

Figure 3.
The rich pine tree, 'Sucksongryoung' that owns farmland and pays property tax. In the 1927, a childless farm couple left their land to a big pine tree in their village. Since that time, the tree has been registered as the official owner of the land.

Such examples still exist until today; a charismatic pine tree with minister's rank bestowed by a king, a rich personified pine tree registered as a legal tax payer paying property tax every year until today, pine forests planted when capital city was moved from *Gaesung* to Seoul 600 years ago are referred to in Korea's national anthem. All these pine trees and forests are still around modern Koreans. Thanks to the agrarian culture maintained over thousands years, symbols of pine trees are engraved in Korean mind and psyche as if they were a genetic code in our DNA. Therefore even today whenever universe, life, longevity, integrity, principles, saintliness, and elegance are referred to, pine trees automatically emerge to our mind.

## 3. Pine Forests as Traditional Korean Cultural Landscape

Few people don't realize pine trees as a symbol of Korean mind or as part of traditional cultural elements. This symbolic meaning of pine trees has been shared, accumulated, developed and changed to become a cultural code representing Korean identity. The more clear examples of pine forests representing Korean cultural identity can be found in the forests established for *feng shui* principles and for security. Pine forests protecting tombs for dead souls, and the same the pine forests around villages protecting well-being of living people have formed representative cultural landscape of Korea.

### 3.1. Pine Forests around Tombs and Cemetery

Being evergreen with rush green needles, pine trees have been regarded as a symbol of everlasting, non-surrendering, and non-declining nature. Therefore, those who aspired long lasting dynasty and prosperity of family planted around their ancestral tombs and those trees became part of typical traditional cultural landscape in Korea. Such role of pine trees as a cultural landscape element still continues to these days.

Figure 4.
The pine trees planted around the royal tomb are representing the confidence that pine tree will bring a good luck to royal descendants. For good luck and longevity of royal family and dynasty, pine trees were always planted around the royal tomb as one of a Feng shui practices.

### 3.2. Pine Forests around Capital Cities

Pine trees have long been planted around national capitals to fulfill *feng shui* principles. *Koryo* dynasty(AD 918-1392) founded the nation's new capital in Songak. History of *Koryo* dynasty records a story that new nation could be successfully founded by planting evergreen pine trees around denuded rocky-mountains in *Songak* (Kim, 2001). *Chosun* Dynasty government chronicle records that *Chosun* dynasty built after the end of *Koryo*, also planted pine trees in *Namsan* hill located in the center of the dynasty's capital, what is Seoul today. The reason that two dynasties planted pine trees around the capital was ancestor's belief that pine trees symbolize the longevity and prosperity of a dynasty.

### 3.3. Pine Forests around Palaces

Pine trees, a tree of life, were planted around Royal residences for *feng shui* purposes. Pine trees appear in '*Dongkwoldo*' , a plan showing King's residential buildings of *changdukkung* and *changgkyungkung*. Large individual pine trees and several pine groves were established across the palaces at the time, which is quite contrast to what they are today with no such trees. Although there exists no sign of such large pine trees and groves, photographs from the late $19^{th}$ and the early $20^{th}$ centuries clearly show that old pine trees were growing big in those two palaces. Scenic images of the landscape, created by old pine trees around *Okryucheon Soyochung*, were captured by Ameri-

can astronomic scientist's photography in 1883. Tall and straight pine trees around *Inchungcheon* and *Daechocheon* also appeared in the book '*Corea Coreani*' by Carlo Rosetti who was the Italian Consular General in Seoul from 1902 to 1903. These records support the fact that pine trees played a role to shape Korean traditional cultural landscape around palaces (Chun, 2004).

### 3.4. Pine Forests around Scholar's Residences

Pine tree was a tree most loved by Korean scholars who always wanted to have them around. In the history of three ancient Korean Nations, *Choi, Chi-won*, a best known scholar at the time, is recorded to build gazebos and summer houses, planted pine trees and bamboos, and spent rest of his life for reading hundreds of books after traveled through forests and along the rivers and seashores of the country. Pine trees were most preferred species by *Koryo* people who planted pine and Korean pine (*Pinus koraiensis*) in their backyard. Scholars also planted pine trees around their residential homes and Confucian schools to mimic and practice the tree's evergreen and unyielding vitality, fidelity, and integrity, which symbolize the virtue of scholar. Today pine trees are still standing around old traditional buildings and Confucian schools to boast of being part of the traditional cultural landscape.

### 3.5. Pine Forests around Villages for Security

Pine forests were also established around villages to protect from natural disaster such as storm, salt spray, and flooding. The forests established for this purpose is called 'village forests' and played important role to shape Korean traditional landscapes across the farming community (KFRI, 1995).

Figure 5. Pine trees were planted for windbreak at villages, which contributed partly to Korea's traditional landscape.

## 4. Pine Trees and Forests Representing Korean Identity

Pine is a species adapted to Korean natural environment over thousands of years. The reason why pine is called national tree in Korea is the fact that this tree has been most beloved tree species in the country. The landscape created by pine trees in Korea is the result of the long materialistic and spiritual relationship established between our ancestors and this tree. So pine tree and pine forests are not only economic resources but also cultural resources shaping Korean identity. Pine trees role to make Korea what Korea should be still continues. Usually an identity of a country is established and continued by contemporariness and popularity. However closely our ancestor's life was related to pine trees, pine trees cannot be a symbol to present Korean identity unless modern life style maintain the same relationship. Such identity cannot be supported by contemporariness.

Figure 6.
Pine dominated cultural landscape continues even today. Pine trees planted a building around Korea University campus as part of restoration project of Korean cultural landscape.

In Korea pine trees are not used for farming implements, firewood, shipbuilding materials, or famine food any longer. Nevertheless, pine trees continue its role even in this industrialized society. Now pine trees are planted around monumental buildings, in city's green spaces, along the historic streets so that they still play an active role for shaping the cultural landscape of the country. The best example of this would be the pine trees planted in the front yard of *Cheongwadae*, presidential office and residence in Seoul.

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## Restoration of selected beech coppices

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### Abstract

The coppice selection system was a special type of utilization of beech copse practiced in the Italian mountains up to the first half of the 20th century. The improvement of social and economic conditions of mountain populations and the progressive shift from an intensive use of the wood toward a protective policy led to the conversion of many beech coppices into high stands. Amongst abandoned copses we can still find some that show the typical features of the coppice selection system. This work evaluates the possibility of restoring the beech coppice selection system in the Appennine between Tuscany and Emilia-Romagna, assessing the dendrometric characteristics of the stands and determining the forest operations needed to restore the system.

### 1. Introduction

The use of wood for domestic heating and cooking was very common in rural areas and the small mountain villages of Italy until the Second World War. Most of this wood was harvested from coppice woods for this purpose. In Italy clear felling with the release of standards was and it still is the common silvicultural system for copse management. In mountain areas, where beech woods are widespread, a particular type of cut known as the coppice selection system *(ceduo a sterzo)*, or ant cut *(taglio della formica)*, was also in use.

According to the Italian National Forest Inventory, beech woods extend over an area of about 700.000 ha in Italian mountains. In 1985 beech copse was still the most common type of management, practiced over more than 400.000 ha mainly in the northern Appennine and in the Alps; about 10% of it was selected coppice. In recent times there has been a decline in pressure on this woodland type; in fact about 45% of beech copses have an average life span of more than 30 years (Castellani et al, 1988). If a copse has not been regularly cut nor converted into high stand it can then be said to be in state of abandonment.

In the past century that conversion to high stands is the most appropriate silvicultural intervention has become the established view. On this subject many experimental trials have been started in order to define coltural and productive aspects (Amorini e Fabbio 1991; Amorini e Gambi, 1977; Amorini et al, 1995; Bianchi e Hermanin, 1988; Padula et al, 1988) and many public campaigns have been carried out in order to convert to high stand vast areas of Tuscany and Emilia-Romagna (Bianchi, 1976; Gambi, 1968; Hofmann, 1963; Premuda, 1957).

Only a few years ago the idea of restoring coppice selection system would have sounded bizarre and not worthy of study. Despite this, some changes in forest management perception such as the idea of multifunction capabilities and the structural diversification of stands, the possibility of profitable cuts, thanks to the great increase of copses that have not been cut for a long time, have lately made the idea of selective coppice restoration an acceptable topic of discussion.

For those forests already mainly converted into high stands, where the current management policy is aimed at the spontaneous development of unproductive copses, the restoration of the coppice

selection system can be considered a useful diversification from the perspectives of environmental-biological stability, wood production, forest workers and their professional skills. The development of new technologies of forest biomass use for energy production provides a rationale for analyzing the coppice selection system in the framework of planned forest management. Selected coppice, compared to simple copse, provides smaller volumes but requires more frequent cuts.

This trial[1] evaluates forest formations dominated by beech in the regions of Emilia-Romagna and Tuscany, where permanent sample plots have been set up for the study of methodologies aimed at the restoration of coppice selection system on abandoned beech coppices.

In Emilia-Romagna coppices spread over an area of 316.578 ha, of which 73.790 ha are beech coppices and 9.937 ha are under a coppice selection system (about 14%) (Regione Emilia-Romagna, personal comunication). In Tuscany, over an area of 670.096 ha of coppices, of which 54.960 are beech, selected coppices represent 3.184 ha, less than 6%, but the 28.000 ha of copses that are considered "aged", most of which selected copses, should be added to this number. Converted high stands are 13.200 ha, mainly coming from coppice selection system (AA.VV., 1998).

The objective of this work is to give a support to management options for those beech copses currently in state a of abandonment, by developing a replicable procedure to restore selected copses that may be considered, in particular socio-economical-territorial situations, a feasible alternative to conversion to high stands, emphasizing multifunctionality and the diversification of wood sources.

## 2. Advantages and disadvantages of coppice selection system

Limitations to the use of coppice systems for beech include its relatively poor ability to produce new shoots, its preference for deep and fertile soils, and the need to protect stands from adverse weather conditions, at least when young.

According to many experts the main limitation is beech's low shoot-producing ability and on the slow initial growth of new shoots (Crivellari, 1955; Bernetti, 1995); others maintain that root shoot growth can be stimulated using special cutting techniques (Mannozzi-Torini, 1949; Ciancio e Nocentini, 2004). All agree that recurrent interventions and the permanence of vital shoots on the stump, typical of selected coppice, limit vegetative reproduction in beech.

Beech prefers deep fertile soils, covering it with its dense canopy and thick litter, but in coppice management when the cut is performed soil is exposed by partial removal of litter and fertile topsoil (Hofmann, 1991). Selected coppice reduces these harmful side effects thanks to the permanence of vital shoots on the copse.

Surely the best type of management for beech is in high stands, but there is general agreement that within copse management, the coppice selection system is the most suitable; Poggi (1960), for example, suggested the improvement of beech copses by transformation of simple copse into selected copse. However in the last fifty years the coppice selection system has been progressively abandoned due to the following reasons:

- Reduction of demand for fire wood.
- High cost of felling operations in remote, roadless, areas.

[1] Permanent sample plots have been set up in Tuscany by ARSIA within the project "Relationship between silviculture management of woods and slopes stability" and in Emilia-Romagna by the Consorzio Forestale Alta Val Secchia in the frame of the "Appennine Forest" project in collaboration with Studio Verde snc..

- Difficulty in shoot selection and felling operations.
- Poor cutting technique and poor selection of shoots in age classes (quality and number) causing slow but progressive heightening of the stump.

Evidently the abandonment of this type of treatment has occurred along with the improvement of social and economic conditions of the mountain population. Consequently as policies favouring intensive use have given way to preservation, many beech copses, including selected coppices, have progressively been converted into high stands.

## 3. Treatment features

The classic cultivation model of selected coppice is represented by an uneven aged copse. The regular application of the silvicultural system would result in shoots of three size classes corresponding to three age classes on a single copse. In some environments, a more simplified treatment would yield shoots of only two age classes[2] on each copse (Hermanin, 1981). The period of felling (λ), the felling diameter and the age of mature shoots depend upon the desired size of harvested wood and the fertility of the site.

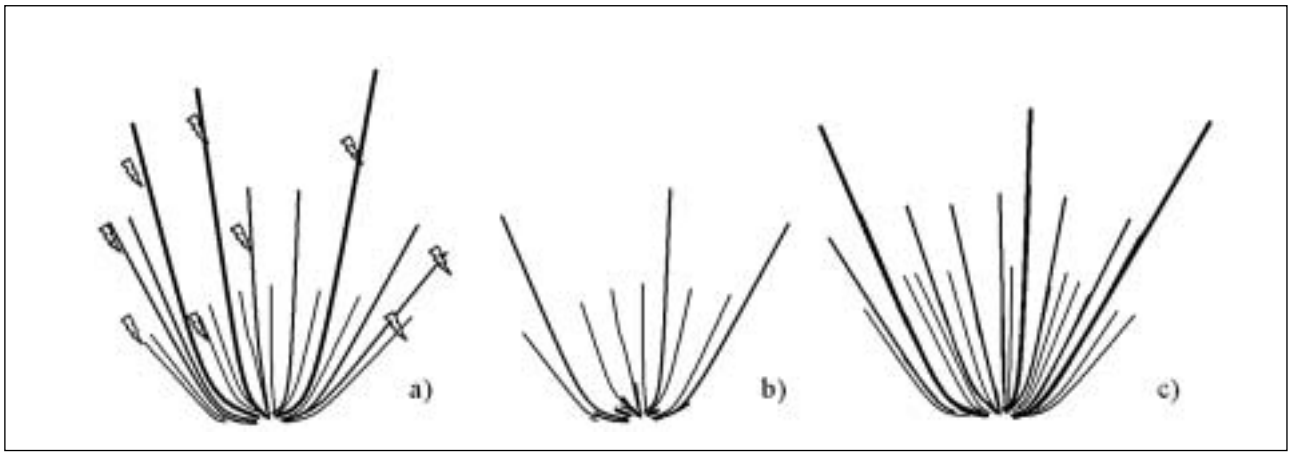


Figure 1. Sketch of a beech stump under the coppice selection system. The different thickness shows three different age classes of shoots. a) condition immediately before felling, b) immediately after felling, c) after λ years. The symbol ✎ in a) shows the individuals to be cut with the selection cut.

Buffolo (1936) described two kinds of coppice selection systems (moderate with short felling period, or strong with long felling period) of 6 and 10 years of felling period and a rotation (t) of 18-30 years. Patrone (1944) cited a value for λ ranging between 6 and 8 and for t between 18 and 24. According to Mannozzi-Torini (1949) λ varies between 6 and 8 and t between 18 and 24. Cantiani (in Hermanin and La Marca, 1985) points to 36 years the maximum cutting age with a felling period of 12 years. Finally, according to Bernetti (1995), λ varies between 9 and 12 with t ranging between 27 and 36.

Short felling periods and a low cutting diameter, usually between 8 and 10 cm, were typical of charcoal production (Mannozzi-Torini, 1949) which was the main produce of coppice selection system.

[2] "t" is the average life span of mature shoots for a determined assortment (also defined through a fixed cutting diameter) and λ (1/3 t) is the length of the period of selection cut, at each felling shoots that reached t age is removed, and younger shoots are selectively thinned (which means shoots at the end of the second felling period (2λ) and eventually shoots at the end of the first felling period (1λ)), creating the right circumstances for the growth of a new generation of shoots (Figure 1.).

In the literature, reported growing stocks are usually low, ranging from 30-40 to 70-80 $m^3$ $ha^{-1}$ before felling depending on the fertility of the area (corresponding to 5-6 and 15-20 $m^3$ $ha^{-1}$ after felling) (Patrone, 1944). For beech selected coppice, only Buffolo (1936) indicates sustained yields of 6-7 to 9-10 $m^3$ $ha^{-1}$ $y^{-1}$, coming mainly from shoots in the third age class.

## 4. Regulatory law

Depending on the characteristics of the stand we need to consider the policy related to the definition and to the way of carrying out coppice selection systems, and also to the definition of "aged coppices"[3] . According to Tuscan regional policies "*In coppice selection system felling is allowed when the bigger shoots have reached 24 years of age for beech […], at least thirty standards per hectare have to be left […], shoots belonging to the oldest age class are allowed to be cut if they have reached the age of the turn, leaving all the remaining ones, except for a moderate selection thinning with coltivation criteria […]. Between two cuts there has to be a period of at least one third of the turn* [of 24 years]" (Regione Toscana, 2003). Regulations for Emilia-Romagna recommend that "*In coppice selection system selection felling is allowed when the oldest and most developed shoots have reached 30 years of age and the diameter at breast height is bigger that 10 cm. The cut has to involve correctly all diameter classes. The minimum selection felling is 10 years. The cut must involve less than a third of all vital shoots*" (Regione Emilia-Romagna, 1995).

Moreover, according to Tuscan policy, all copses of more than 36 years of age are considered old, and until 50 years they can be coppiced only with permission. Beyond this stage coppice cuts are only allowed in particular cases, when stand features are not suitable to conversion to high stands (Regione Toscana, 2003).

In the policies of Emilia-Romagna, coppice is said to be aged if it is 1.5 times older the minimum established rotation (which for beech is fixed at 28 years), and selected coppice is considered old when the oldest shoots on the copse have reached 36 years of age. For these stands conversion to high stand is strongly recommended; even though felling and coppice restoration are allowed depending upon confirmed ecological parameters of the area and in relation with the actual planning tools (Regione Emilia-Romagna, 1995).

## 5. The restoration of coppice selection system

In the process of restoring the coppice selection system on abandoned beech coppices we have to think about structural and physiological features, calibrating the intensity of the operation as a function of the vitality of the stand and the conditions of the area. These features may be inferred by the "cultural abandonment class" – as the period of abandonment increases, the shooting capacity of the stumps decreases and there is a progressive selection of the dominant individuals of the stand.

We therefore tried to define some classes of cultural abandonment for the coppice selection system as a function of the time since last selection cut (comparing with the ordinary utilization limit):

- delayed utilization: utilizations are delayed up to 10 years beyond the ordinary limit;
- abandonment: utilizations are delayed 10 to 20 years;
- prolonged abandonment: utilizations are delayed for more than 20 years.

[3] Commonly (but not correctly) we define "aged coppices" those coppice formations that are not biologically old but where the abandonment of utilization has exceeded the ordinary time limits.

In practice we have to manage in different phases passing through a time of transition with the removal of a limited number of individuals for each age class, so that the restoration is then accomplished through one or even two interventions closely following the first.

It is very important that the restoration operations are not too heavy, that the removal of individuals over the felling diameter happens gradually, in order to leave enough protection to those younger shoots that are usually very slight, if grown in a dense wood. It is also important that plants of the first age class, if there are any, are retained in order to compensate for possible lack of production of new shoots. In fact, it is not at all certain that stumps will respond to cut with an adequate production of shoots. In any case the objective of the restoration procedure is the re-establishment of the stump in order to encourage the production new shoots.

The number of standards of a coppice selection system should be limited; they usually carry out two main functions (seed production and soil protection and cover), but the soil production function is already fulfilled by the permanence of shoots. The number of standards should not go beyond 50 per hectare and it would be appropriate if they had neither large dimensions nor broad canopies as they would occupy an area eventually available for coppice development.

In addition, when necessary, it is strongly suggested to remove exceeding standards or replace the over-sized ones (very frequent in those copses of prolonged abandonment as advantaged by the dominant position over shoots) with individuals chosen amongst shoots.

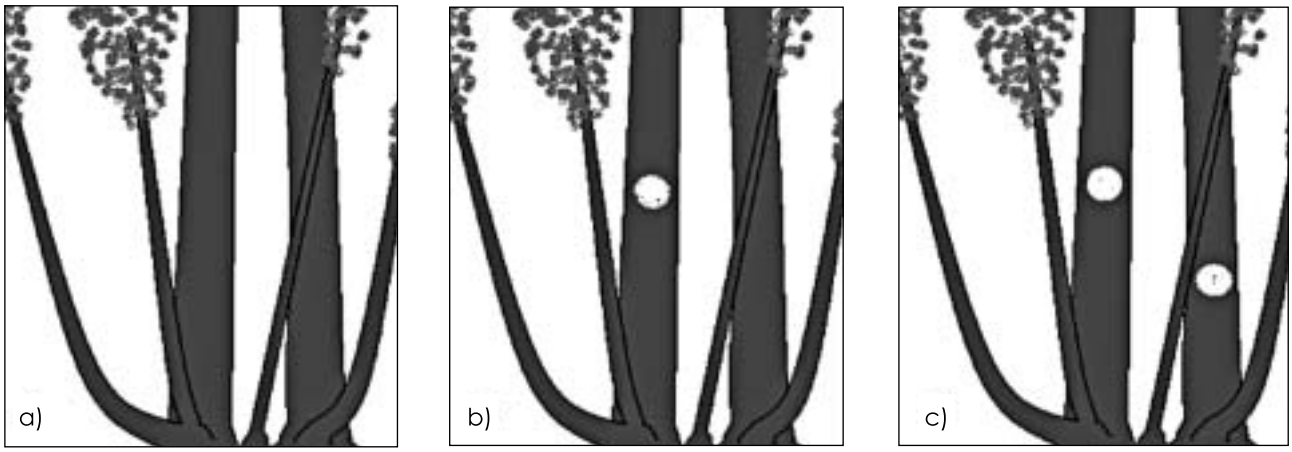


Figure 2. Example of procedure for the restoration of coppice selection system; a) older coppice before felling; b) moderate removal of a single mature shoot; c) strong cut with the removal of nearly all dominating plan

## 6. Characterization of the study areas and trial metodology

The trial was carried out on both sides of the watershed of the Tuscan-Emilian Appennine, in forest stands mainly characterized by beech wood, where selected coppice was very popular for the supply of fuel wood (Fornaciari Chitoni, 1964; Bianchi, 1976). In the last decades many copses have been converted into high stands, but there are still some unconverted copses especially in areas of negative stumpage. The trial areas were selected coppices in a prolonged state of abandonment with average life span of larger shoots[4] of about 60 years and a period of abandonment of 30-40 years (corresponding generally to the average life span of younger shoots).

[4]The concept of average life span as mean value of life spans of a sample of individuals cannot directly be applied to an uneven aged stand as selected coppice may be considered; it is more appropriate to relate it to a range of ages in which shoots will spread, more or less evidently, according to age and diameter classes

The trial was based on three permanent sample plots: A and B located in the high Val Secchia (Emilia-Romagna) covering an area of 6000 and 4000 $m^2$, respectively, and C located in Garfagnana (Tuscany) with an area of 1750 $m^2$. In order to describe the state of the stand

before intervention, dendro-auxometric surveys were carried out and the vitality of stumps was tested. Operations for the restoration of coppice selection system were carried out, varying by the cultural abandonment class of the stands and the characteristics of the area. As the stands were structurally well-developed, the intervention did not involve regulating stand structure according to selected coppice regular model, but was designed to attain a transitory situation with full restoration completed through a second intervention in 4-7 years time.

## 8. Results

### 8.1. Diameter distribution and structure

The distribution of diameter classes before intervention was typically uneven aged, moving towards broader diameter classes[5] with respect to a selected coppice stand. This situation can be noticed particularly in B and C, where the overall number of individuals per hectare is low, while the percentage of individuals belonging to diameter classes wider that 10 cm is high. The number of dead stumps (excluding standards) gives an indication of the reduction of coppice density comparing to the original number (before cultural abandon); this reduction amounts to about 20-25% of the original value (Table 1).

Table 1. Number of living and dead stumps over a one hectare area in sample plots

| plot | living stump | dead stump | total stumps | % of dead stump |
|---|---|---|---|---|
| A | 1542 | 567 | 2109 | 27% |
| B | 1142 | 408 | 1550 | 26% |
| C | 1154 | 263 | 1417 | 19% |

### 8.2. Growing stock and increment

Thanks to the ageing period and the subsequent biomass accumulation, the growing stock in sample plots is extremely high, higher than any value recorded in alsometric tables for beech copses. (Giordano, 1949) Such values are found only in high stands converted long time ago (Amorini *et al.*, 1995). As already found in other copses (Hermanin e Pollini, 1990) the extension of the period between two utilizations leads to an increase of wood production. Current increment of biomass (calculated in A and B) amounts to 10 $m^3$ ha-1y-1, a value which is equal or higher than those recorded for 60-year-old beech in even aged high stands (Cantiani e Bernetti, 1963; Bianchi, 1981) and nearly twice the values recorded for beech copses at the height of their current volume increment (Giordano, 1949).

### 8.3. Restoration procedure

Thirty to 50% of individuals were removed (in proportion with a higher removal in higher diameter classes) reducing the original basal area by 40 to 60%, to approximately 150 $m^3$ ha-1. The main removal carried out on higher diameter classes led to a reduction of 1-2 cm of the dominant

[5] In the bibliography usually the cutting diameter amounts to 8-10 cm (Buffolo, 1936; Patrone, 1944; Mannozzi-Torini, 1949; Camia et al, 2002).

diameter of the stands (Figure 1). The volume of biomass removed is high, but a good amount of growing stock still remains (between 130 and 180 $m^3$ $ha^{-1}$) and this may sustain the production of wood mass during the following years without any halt of increase (Table 2, Figure 2). Even after the intervention, growing stocks in the sample plots are higher than the ones recorded in the literature for selected coppice, which are, at most, 80 $m^3$ $ha^{-1}$ (Patrone, 1944). This gives a good safety margin to the intervention in terms of growing stock reserve and provides the opportunity to carry out a new, light, intervention within a short time, to be calibrated as a function of the stand response. In fact a good number of shoots belonging to diameter classes larger than 15 cm remain to be gradually removed in the succeeding cuts in order to leave the remaining shoots with an adequate protection and to evaluate the response of the stumps in terms of production of new shoots. The quantity of optimal growing stock, of useable biomass, of potential increases aren't actually measurable and will have to be determined on the basis of future development.

Table 2. Dendrometric characteristics in sample plots and data of the procedure of restoration[6]

| plot | situation | $N_{sh}$ | $N_{st}$ | $N_{tot}$ | $\%_{cut}$ | $d_d$ | $h_d$ | G | % cut | V | % cut |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | before cut | 5608 | 52 | 5660 | | 18,49 | 17,41 | 43,37 | | 306,38 | |
| | cut | 1645 | 35 | 1680 | 30% | 17,62 | 17,15 | 21,69 | 50% | 162,31 | 53% |
| | after cut | 3963 | 17 | 3980 | | 15,18 | 16,32 | 21,68 | | 144,06 | |
| B | before cut | 3330 | 63 | 3393 | | 21,02 | 18,04 | 39,11 | | 297,24 | |
| | cut | 945 | 28 | 973 | 29% | 17,45 | 17,10 | 14,78 | 38% | 115,64 | 39% |
| | after cut | 2385 | 35 | 2420 | | 18,60 | 17,44 | 24,33 | | 181,59 | |
| C | before cut | 2846 | 80 | 2926 | | 23,94 | 18,42 | 44,25 | | 337,13 | |
| | cut | 1377 | 46 | 1423 | 49% | 22,47 | 17,97 | 26,89 | 61% | 206,42 | 61% |
| | after cut | 1469 | 34 | 1503 | | 16,93 | 15,77 | 17,36 | | 130,71 | |

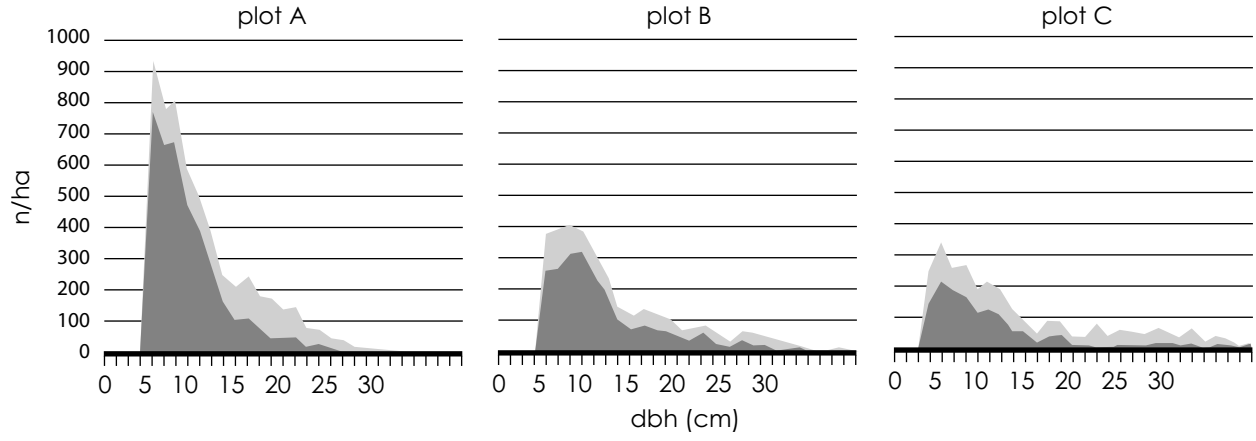


Figure 1. Size class distribution of the number of shoots removed with the intervention (light grey) and shoots left after the intervention (dark grey)

[6] $N_{sh}$, $N_{st}$ and $N_{tot}$ they represent the number per hectare of shoots, standards and total value, $d_d$ (cm) and $h_d$ (m) represent dominant diameter and height of shoots (calculated on the 400 bigger shoots per hectare), G ($m^2$) is the basal area, V ($m^3$) is the volume. The percentages are referred to the initial value (before intervention) of the dendrometric mass.

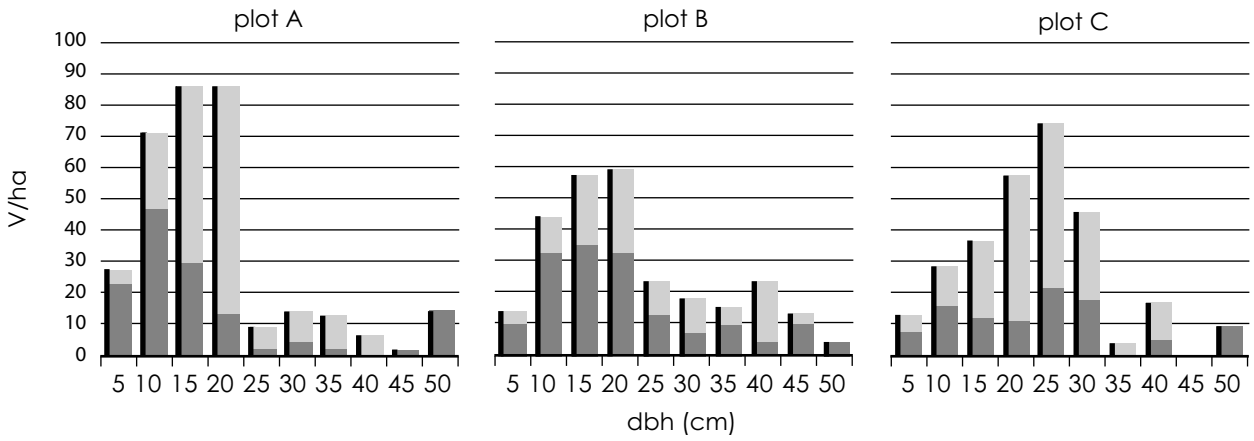


Figure 2. Distribution of volume per hectare, by 5-cm diameter classes, of shoots removed with intervention (light grey) and shoots remaining after intervention (dark grey)

## 9. Conclusions

If confirmed by a positive response of the stands, the trial is expected to show how coppice selection system can be restored to beech coppices that have maintained a good structural uneven ageing. The cultivation setting of the coppice selection system is no longer the classic one as described in literature but rather a formation with a higher minimum level of growing stock capable of producing enough biomass to make the continuation of the treatment viable. Periods of selection cuts longer than the ones commonly recorded (8-12 years) will be necessary, eventually leading to stands with only two age classes. This detail, to be verified in treatment practice, may even simplify the cutting operations and consequently reduce the costs of utilization, as described by Perrin (1954) for the Pyrenees. However, the problem of practical execution of cuts remains, and this is a key to a desirable outcome and for the continuance of the treatment itself. All authors agree that a good outcome depends mainly on the skills of specialized cutters who must have confidence with this type of cut. Some even suggested that these workers may get transferred to those places where the treatment has been spread unsuccessfully (Poggi, 1960). Nowadays there is a deficiency of such specialized personnel, so if there is a real determination to proceed with the restoration of this silvicultural system, it is necessary to develop practical courses and provide training on the correct application of the method. The use of chain saw may be difficult for the application of selected cuts (traditionally made with hatchets), but with special cares it may work well, for example using light chain saws to facilitate work in a thick copse, without damaging the remaining shoots.

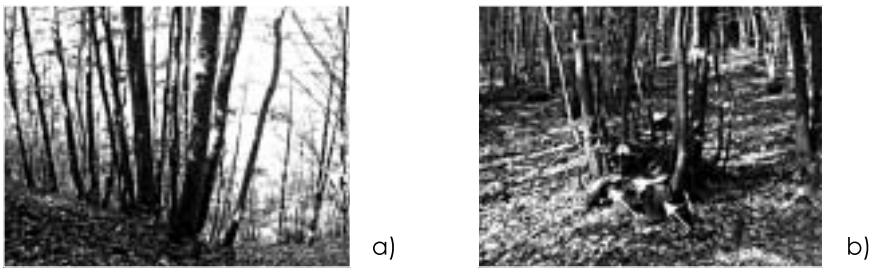


Figure 3. Selected beech coppice in high Val Secchia. (a) Advanced structure of a copse with at least three big shoots; (b) copse after the selection thinning (arrows indicate two big shoots removed) (Photo by Molducci).

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## Getting to living cultural landscapes of the boreal forest through holistic forest management. The Whitefeather Forest Initiative of Pikangikum First Nation, Northwest Ontario

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### Abstract

In this paper I present research that has been undertaken with Pikangikum First Nation in northwestern Ontario, Canada as part of their Whitefeather Forest Initiative (www.whitefeatherforest.com). Pikangikum is an Anishinaabe Nation located 120 km northwest of Red Lake, Ontario regarding cultural landscapes, sustainable forest management and protected areas. A core principle of the land-use strategy being developed by the First Nation through a partnership with the Government of Ontario is the recognition that the Whitefeather Forest is a cultural landscape that has been shaped by aboriginal people who in turn have been shaped by the land. The goal of their land use strategy is to find new forest-based opportunities by which the land can provide sustainable livelihoods for their youth in a way that maintains the "beauty" of the land. The purpose of the research reported in this paper is to understand the dynamics of cultural landscapes and the intersection of such processes with state legislation. The objectives were: (1) to visit and document sites mapped as cultural and ecological values by the Whitefeather Forest research team of Pikangikum First Nation; (2) to specify the spatial and temporal characteristics of land-based values; (3) to understand the cultural landscape from a Pikangikum perspective; and (4) to analyze legislation being proposed to enable the Whitefeather Forest Initiative.

Cultural landscapes, in Canada, tend to be represented as a set of values that are situated spatially as site specific and temporally as from the past. In this research, sites that fit this description can be grouped on the basis of cultural values, such as burial grounds, habitation, livelihood activities, ceremonial practices and physical features that are part of the cultural narratives of Pikangikum people. Similarly, others sites can be grouped together through their role in ecological process that sustain plant and wildlife populations upon which tangible values such as food are based. Other features, such as travel routes, link together these sites into a web that blankets the landscape. Pikangikum people consider that these sites and routes emerge out of living relationships that continue to sustain Pikangikum peoples' sense of belonging to the land, their material and spiritual well-being and their identity as a people. This relationship is seen to be taking new directions as Pikangikum elders recognize that their previous way of life, economically based upon the fur trade, is no longer viable and new land-based opportunities are being sought such as commercial forestry and tourism. They recognize the importance of protecting culturally and ecologically significant sites but at the same time seek to shape contemporary relationships with the land.

Our conclusion is that the Ontario provincial government tends to utilize its legislation as fragmented pieces while Pikangikum's holistic vision of the keeping the land requires a coordinated use amongst three key pieces of legislation: (1) The Crown Forest Sustainablility Act, applicable to sustainable forest licences, enables the licence holder to lead the planning process for lands designated for commercial forest operations; (2) The Ontario Parks and Conservation Reserves Act provides partnership opportunities to lead management and administration of protected areas; and, (3) The Ontario Heritage Act, has broad application on Crown lands and can enable communities to define values to be conserved for cultural heritage landscapes. State governments, such as Ontario, will be required to coordinate legislation so that indigenous peoples can continue to shape cultural

landscapes as they make decisions for their traditional territories based upon their relationships, knowledge, customs, spirituality and values. While cultural landscapes have been the purview of heritage conservation it may be that indigenous peoples can bring them back to life provided with the appropriate tools for holistic forest management.

# Meeting the challenges of preserving cultural character in a dynamic forest park landscape

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## Abstract

The Mount Tom Forest of Marsh-Billings-Rockefeller National Historical Park, in Woodstock, Vermont, is the earliest surviving example of planned and managed reforestation in the United States. An actively managed forest and cultural landscape, the woodland illustrates the evolution of forest stewardship in America, from the earliest scientific silvicultural practices borrowed from 19th century Europe to contemporary practices of sustainable management. The forest includes softwood stands of Hemlock, White Pine, Red Pine, European larch, Norway spruce, and Scotch pine that vary in age from 40-years to over 100-years old. In 2005, Marsh-Billings-Rockefeller National Historical Park received Forest Stewardship Council (FSC) certification for its forest and became the first national park or national forest to be FSC certified in the United States. The national park is named in part after George Perkins Marsh, author of Man and Nature (1864) and first US ambassador to Italy, a major influence on the formation of the modern environmental movement. The national park opened in 1998 with a mandate to maintain and build upon the 140 year-old legacy of stewardship on this storied landscape and its tradition of sustainable forest management. This paper will address the developing a management strategy for the Mount Tom Forest and the public consensus had to be built on the following key questions:

- Given that the historic even-age, single-species (predominately) conifer plantations face strong competition from the natural re-growth of native hardwood trees, can the forest's cultural character and its "readable history" survive and be perpetuated in an environment of dynamic forest growth and ecological change?
- How can a consensus develop around an historic preservation perspective that makes room for the role and influence of natural succession and ecological processes, and a natural resource conservation perspective that is informed and shaped by a sense of history, traditional use and stewardship?
- In particular, how can preservation of a living forested cultural landscape transcend the traditional concept of "material integrity" and a focus perpetuating individual features? As the forest plantations eventually age and decline over time, can management emphasis shift to renewing broad distinctive historic patterns and characteristics of the forest as a whole, and still retain the traditions of forest stewardship?
- In what ways can the forest provide a vital and thoughtful venue for facilitating civil engagement on paths to sustainability and stewardship?
- In particular, how can programs that promote citizen science, youth service, and civic engagement involving teachers, youth, local tree farmers, and others not typically involved in forest planning and forest activities, be encouraged? In what ways can the forest be a catalyst for a broader, far ranging discussion of sustainability, land use and landscape character?

## The forest landscape of transhumance in Molise, Italy

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### Abstract

The transhumance system in the middle-south of Appenines has shaped over the centuries one of the most important historical and cultural landscape in Italy. Abandonment of traditional practices linked to seasonal movements of livestock threatened the conservation of the ancient landscape patterns. In particular, the web of drove roads of transhumance, called *tratturi*, representing in the past a wide connection between Abruzzian pastures and wood pastures and Apulian lowland pastures is now disappearing. This paper focuses on the main land cover changes along the *tratturo* Celano-Foggia over the last five decades in the Molise region. Some results obtained by temporal changes analysis are useful to evaluate conservation and management guidelines of transhumance drove roads in Molise region.

### 1. Introduction

The network of *tratturi* was instituted by Aragonese kingdom at the end of XV century (Di Martino, 2000) following the more ancient roman roads pattern; the *tratturi* were constituted by 12 main roads, 111 meters wide, spreading on the middle-south of Apennines, with a total length of more than 1,350 kilometres. Furthermore the main roads were connected by 72 secondary paths, called *tratturelli* and *bracci* (Figure 1). Along this network, small urban areas, and poor infrastructures as drinking troughs for cattle and sheep, border markers and milestones were built.

Nowadays, because of the abandonment of transhumance systems, most of these landscape elements are disappearing (Bunce et al., 2004), covered by shrubs and trees.

The aim of this paper is to analyse and evaluate the level of conservation or transformation of *tratturo* Celano-Foggia, in the Molise Region.

### 2. Methods

In Molise, the route of transhumance Celano-Foggia has a length of 91,2 kilometres (alt. min 77, max 1092) and intersects different landscape: the area near Apulian plain, covered mainly by crops and olive groves, the middle hilly area shaped by scattered woodland, crops and small vineyards, the highland and mountain area characterised by large forest coverage (Figure 2.).

The preliminary phase of the GIS analysis, involved the digitalisation on screen of the border of *tratturo* Celano-Foggia according to the cartographic representation of Italian Military Geographic Institute of 1955 (scale 1:25,000), and the photo-interpretation of different periods aerial photos (1954-55, 1992, and 1998). A CORINE Land Cover at the scale of 1:25,000 has been developed along the whole route of transhumance Celano-Foggia, for the periods 1955 and 1992. An analysis of land cover transformation has been carried out to evaluate changes at a regional scale. Furthermore, to better resolve the actual condition of a *tratturo* segment (18 kilometres of length) on the mountain areas, a more detailed land cover map of the 1998, at the scale of 1:10,000 was created

using a buffer of 100 meters (figure 3). An edge to edge analysis of the border of transhumance route has been developed to investigate the relationship occurring between land covers.

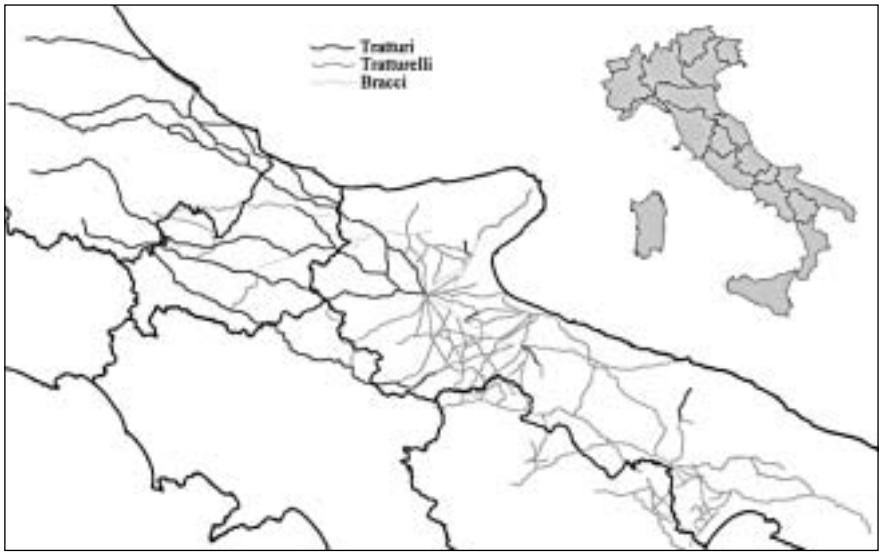


Figure 1. The network of tratturi, tratturelli, and bracci in the middle south of Apennines (see AA.VV., 2004; redrawn)

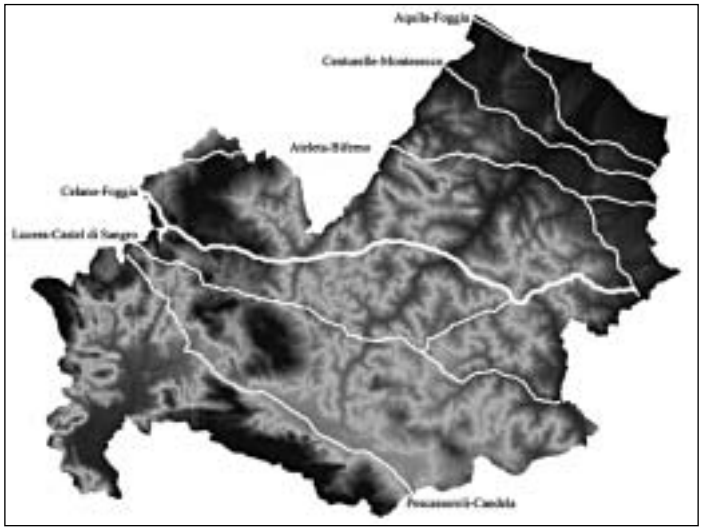

Figure 2. The route of transhumance in the Molise region

### 3. Results and discussion

The results of GIS analysis at regional scale (1:25,000) indicate that during the 50's the typical *tratturo* land cover was mainly represented by rough pastures; whereas the agricultural cover was more extended on low land of the region (due to the renting of *tratturo* areas) and forest coverage was totally absent on the *tratturo* route (table 1, rows). On the contrary during the 90's the pastures cover dramatically decreased transforming in crops, woodlands and shrubs (table 1, columns).

The results of the large scale analysis (18 kilometres segment) show that the conservation of *tratturo* is mainly affected by urbanization, infrastructures, and by the wide expansion of woodland and shrubs starting from 1954; the forest colonised the areas originally used for agro-pastoral and silvo-pastoral practices (Di Martino, 1986) (figures 4 and 5). Whereas traditional practices are still utilized the width of *tratturo* is still identifiable by borders, hedgerows, and scattered trees (figure 6).

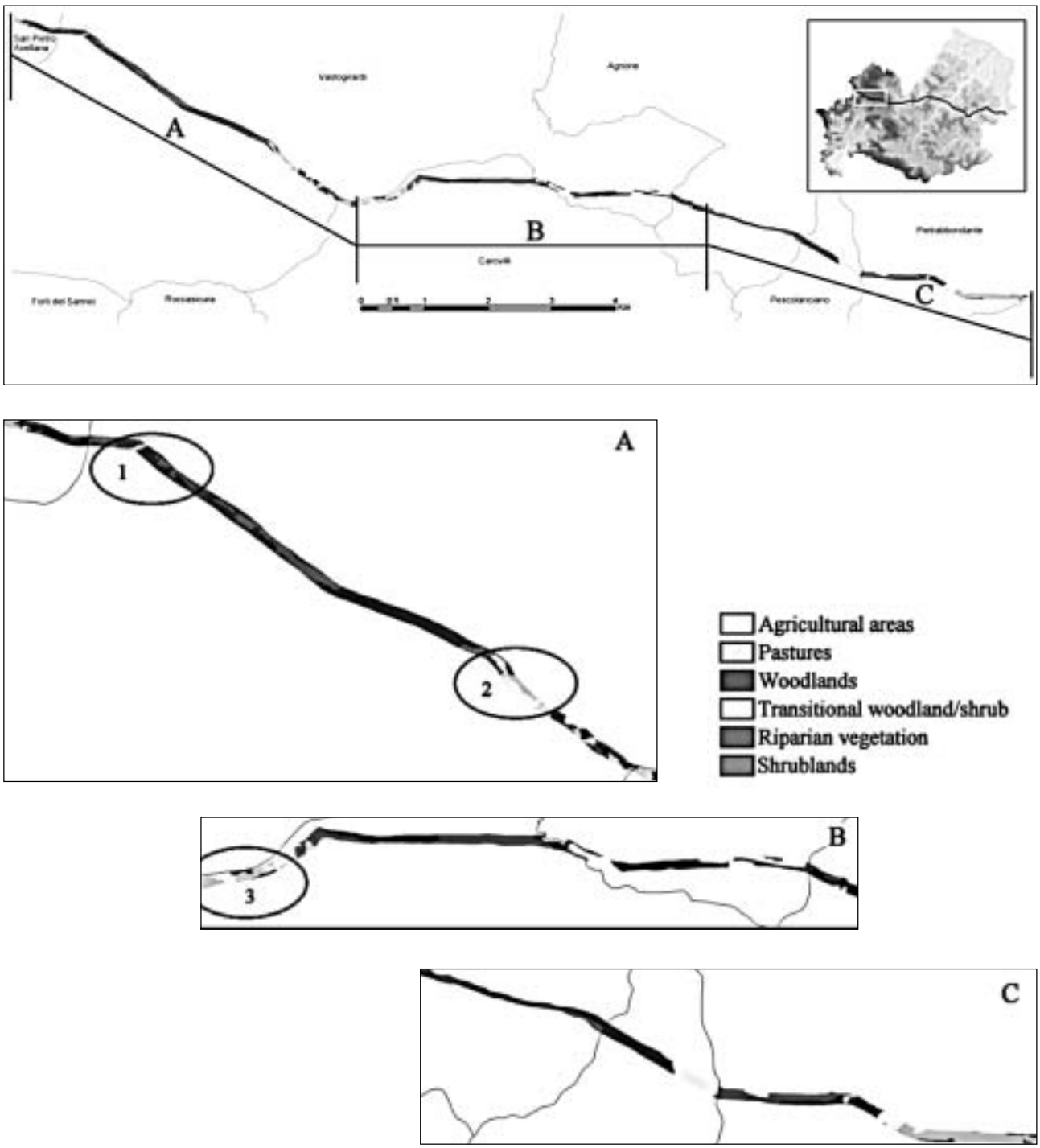


Figure 3. Land cover map of the 18 kilometres segment of the tratturo Celano-Foggia. 1: area near the MaB Reserve of Collemeluccio-Montedimezzo; 2: area near Villa S. Michele; 3: area near Carovilli (see Figures 4., 5., and 6.)

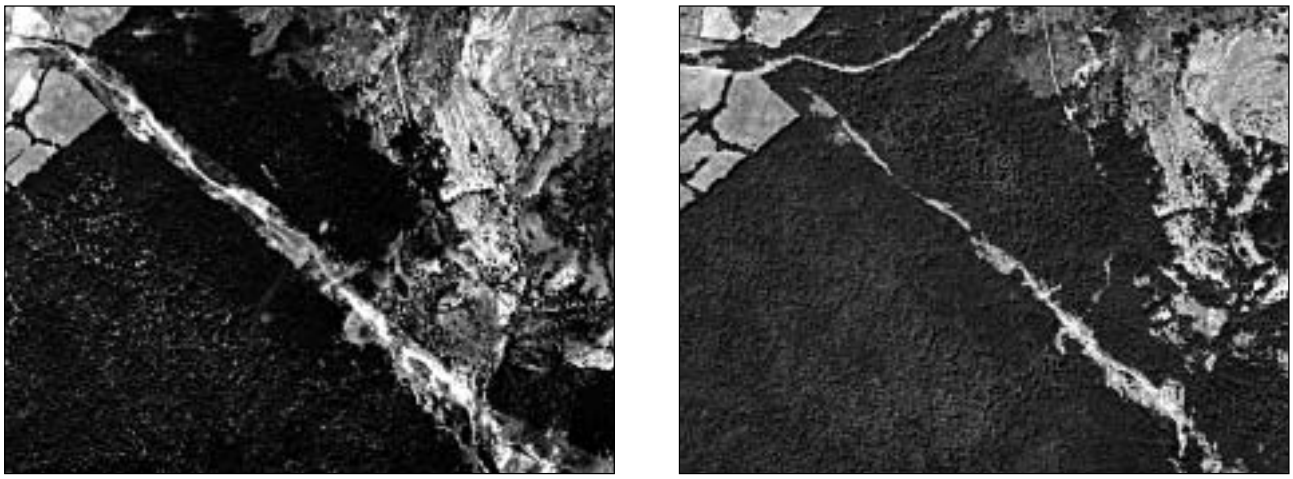

Figure 4. The tratturo Celano-Foggia near the MaB Reserve of Collemeluccio-Montedimezzo in 1954 (left) and 1998 (right). The colonization of woody species (Turkey oak, maple and ash) today covers the main area of the ancient route.

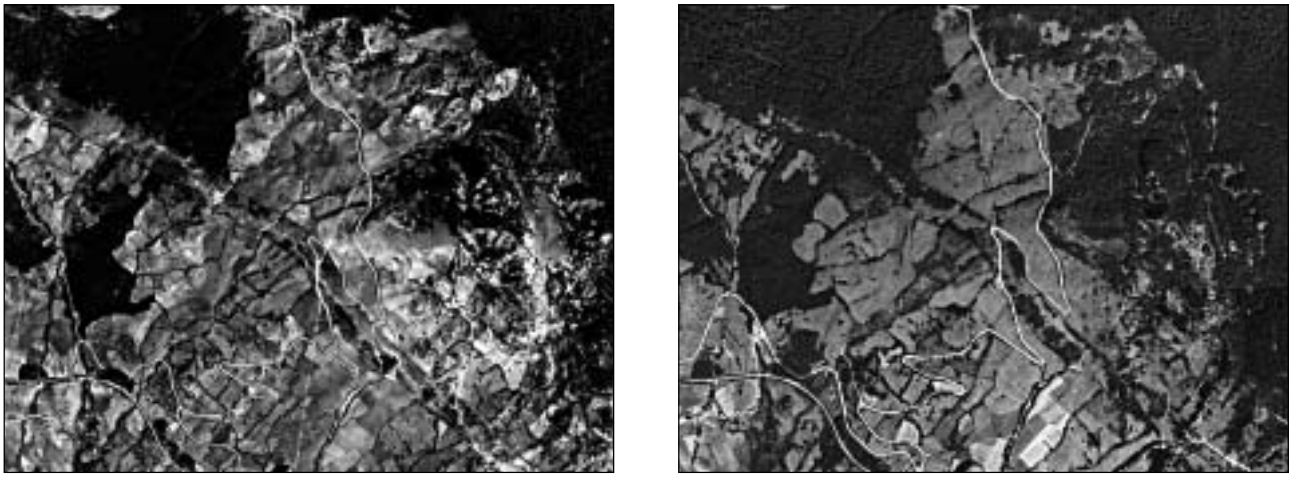

Figure 5. The tratturo Celano-Foggia near Villa S. Michele in 1954 (left) and 1998 (right). In the upper left side (NW) forest vegetation has covered the main route, while in the southern part (SE) the colonization processes had been less important due to the adjacency of crops and pastures still utilized.

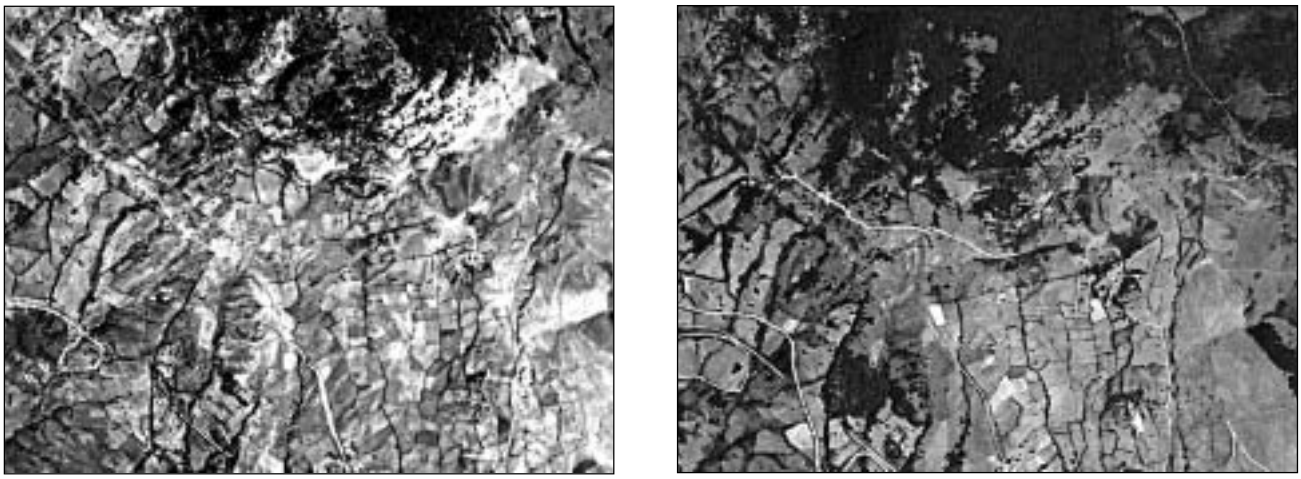

Figure 6. The tratturo Celano-Foggia near Carovilli in 1954 (left) and 1998 (right). In the study area this segment of route seems well conserved, showing hedgerows and scattered trees along the border.

The edge to edge analysis (interior/exterior) shows that critical contacts among different land cover interest particularly pastures (interior) vs. shrubs (exterior) because of intense vegetation dynamic of shrublands in absence of silvo-pastoral practices (table 2). On the other hand, the contact pastures (interior) vs. agricultural areas (exterior) could be considered as positive due to the conservation of the border (hedgerows and trees).

## 4. Conclusions

Some management and conservation suggestions and questions could be obtained by the multitemporal and edge to edge analysis:

- Restoration of sustainable and traditional agro-pastoral and silvo-pastoral practices through policies and funding, particularly in the mountain areas;
- In the case of renting of the *tratturo* area for agricultural use, crops should be diversified from the exterior agricultural use, in order to allow a better identification of the route;
- To preserve the border of the *tratturo* it could be useful to recover linear tree coverage;
- Regarding the woodlands nowadays present on the interior of the *tratturo* area it seems to be a more difficult problem: what can we do? Clear cutting to recover the ancient route or preserve the forest cover? Recovery of wood pasture structure could be a possible solution?

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# Scottish upland forests: History lessons for the future

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## Abstract

This paper sets out to show how historical and cultural land-use in the Scottish Highlands has influenced the development, distribution, structure and composition of upland forests. It challenges the widely accepted Victorian perception of a Highland "wilderness", with an alternative view of a more populated pastoral landscape that prevailed prior to the Highland clearances. There is evidence that from the eleventh century, the Scottish uplands were occupied by people who were managing the land and the vegetation to meet the needs of their pastoral way of life. The breeding and movement of livestock was essential to that way of life, and can be traced back as far as historical records exist. The evidence shows that this pastoral lifestyle, which involved seasonal transhumance existed right across Scotland. It is therefore unlikely that any existing remnant woodland has escaped the influence of grazing management at some point in its history. Three case study areas are examined. These areas have been chosen to illustrate variants of an historic system of transhumance. Cultural, historical and biological records from the three case study areas are related to the surviving woodland remnants. Historic place names have been investigated to give an indication of previous land use and vegetation. GIS techniques have been used to make comparisons between open woodlands on historic maps with present day canopy cover.Within the case study areas the remnants of historic cultural landscapes and associated vegetation, with large open-grown veteran trees, and species-rich upland pastures are related to their historical land-use origins. This paper suggests that consideration of these historical origins can help inform a better understanding of Scotland's landscape heritage and ecology, and should be taken into account in the planning and management of future landscape restoration in the Scottish highlands.

## 1. Discussion of case study areas

Here the different variations of transhumance are discussed in relation to the cultural, historical and biological research that has been undertaken in the different case study areas All are important for their designated Natura 2000 habitats and associated species they support; they are also highly valued for their landscape appeal.

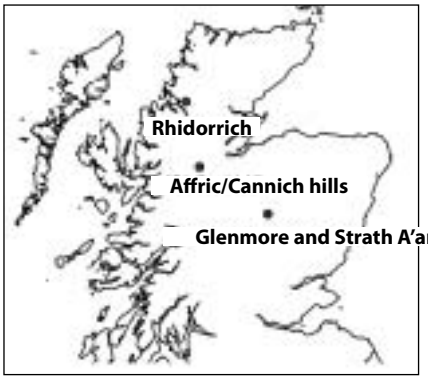



Figure 1. Location of case study areas

## 1.1. Affric and Cannich hills

Palaeoecological evidence from Glen Affric suggests woodland cover here has varied over time (Tipping et al 2006) and there is also evidence of early pastoral activity from c.4000 years ago (Tipping et al) and (Froyd and Bennett). Pollen records show that arable crops were grown on the alluvial valley floors (Davis 1999, 2003), unfortunately there are few archaeological remains as a result of modern hydroelectric schemes.A general increase in tree cover within the Glen in the nineteenth century occurred as a result of the cessation of traditional farming practices. Embedded within this woodland are older, open-grown veteran pines indicative of a previous wood-pasture structure on the gentler hill slopes. Observed ring counts indicate pine of over 300 years. This is consistent with pollen records, which show an open and fluctuating woodland structure in the east of Glen Affric (Shaw and Tipping 2006).

Veteran trees can be used as biological indicators of historic landscapes. They are also important biophysical structures in the landscape, functioning at both the local and landscape scale. Present day scattered open-grown veteran trees found in the wood pastures of the Affric and Cannich hills will have regenerated within the grazed wood pastures of the pre-clearance landscape, and provide ecological and historical continuity to it. They are also loci of woodland ecological processes, and as such provide connectivity for woodland species, as well as for the unique suite of specialist species these old trees support. At the local scale veteran trees provide shelter and a potential food source for livestock, as well as influencing local ecological, hydrological and nutrient cycles. They can be described as keystone features in that they have a disproportionate effect on the ecosystem relative to their individual area occupied, biomass and collective density (Manning et al).

Records for saproxylic invertebrates and lichens (often indicators of ecological continuity) can be related to these areas of historic open woodland, and the old veteran trees within them. The deadwood associated with veteran pines can support a range of rare and specialised species. Assemblages of certain epiphytic lichens are dependent on continuity of woodland cover, and can therefore be used as indicators of ecological continuity. This has resulted in the development of a Native Pinewood Index of Ecological Continuity (Coppins and Coppins 2002) based on the presence of 77 species of lichen. The Affric Cannich hills score very highly using this index, suggesting long-term ecological continuity in parallel with sustainable traditional management through the shieling system.

The Shieling system was a distinctive regional form of transhumance in Western Europe. The yearly visit to the shielings (hill pastures and the settlements associated with these) in Highland Scotland was a Scottish variant of livestock movements, closely tied to Gaelic peoples and bearing strong affinities with the Alpine Transhumance characterised by shorter distance ascents of hill ground. We know that this system of agriculture prevailed in Scotland from at least the eleventh century and is probably much older than that. People practised a kind of mixed agriculture, cultivating some of the better land in the valleys, and keeping cattle (also sheep and goats) for milk and cheese. (Bil 1990). Livestock were moved short distances in the summer up to mountain pastures. This seasonal use of upland pasture was to an extent a carefully planned response to the limited environmental potential of the area. Over the centuries with this practice and continual grazing and dunging of these areas, the vegetation has been modified. These upland pastures which might initially have contained some patches of good grazing, through continual use have been "improved" to the extent that the current vegetation is a result of this historic grazing management. The Shieling system was in fact a highly organised system, with many thousands of people involved in the practice. Today the shieling areas are abandoned and

only the occasional stone wall, or drainage ditch are testament to the extent to which this area was formerly occupied.

Figure 2.
Showing abandoned shieling area and associated wood pasture

Wooded areas in the uplands were perfectly suited to grazing purposes, with scattered stands of timber and spaces in between the pockets of woodland with potential for grazing by deer and domesticated farm stock alike. Woodland and trees that were close by these areas would probably have been cut and used for domestic purposes by the shieling inhabitants (see Figure. 2). The trees would have acted as a shield and created a favourable local micro-climate in which pasture and corn could thrive (Bil). The combination of these land-use practices over centuries has resulted in the development of pasture woodland all over the Highlands (Smout 2003).

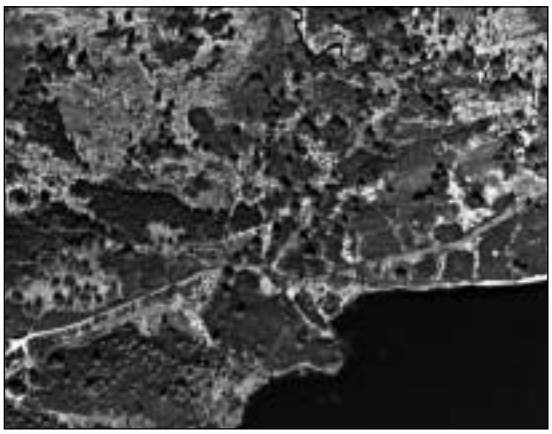
The Shieling custom prevailed across the Highlands until the coming of sheep and depopulation. By the end of the 19$^{th}$ century the tradition was ended, and the hill grounds where once shielings had been became the solitary haunt of the shepherd and sportsman, marking a narrower usage of the resource base and an impoverishment of the Scottish uplands which has remained a major blight until the present day. (Bil)

Historic place names can also give indication of the previous land use of an area and the vegetation that it supported. Glen Strathfarrar is part of the Affric and Cannich hills, and has under gone detailed place name survey (Adams 1979 Taylor 2002). The most comprehensive is based on a plan of the lands in Glen Strathfarrar carried out by Peter May in 1757 (as per Adams 1979) and transcribed (Macdonald and Taylor 2004). This was compiled as a requirement of annexation to the Crown for the Commissioner to the Forfeited Estates, following the Jacobite Rebellion of 1745. The plan of the Glen is in effect a survey of Glen Strathfarrar from the mid 18$^{th}$ century. It not only identifies settlements and shieling areas but also areas of good grazing and tree cover by species for shelter-e.g.'Small wood of birch on this side of the river declines south with good pasture and winter shelter for cattle called ChylaTirravida'. The document also gives the location of these areas by the corresponding place-names as shown on Ordnance Survey (OS) Pathfinder maps (1:25000), and these can be further corroborated by cross checking these with place names on the OS 1$^{st}$ Edition maps as a result of names changing over time e.g. Chyla-Lapigh [OS Pathfinder] and. [Coille na Lapaich,] OS first Edition

From this document 18 shieling and 5 pasture areas were identified in Glen Strathfarrar with the highest at 450m, well above the current tree line. Coire Ghiubhais or 'valley of the Scots pine' (Macdonald and Taylor 2002) is at 600m within Glen Strathfarrar, which would indicate that the tree line was historically much higher. These shieling and grazing areas can still be readily identified today by the current vegetation, through the presence of better quality grassland persisting with scattered open-grown veteran trees and pasture woodland.

GIS techniques allow for comparisons to be made between open woodlands on historic maps with present day canopy cover from ortho-rectified aerial photographs. Illustrated in Figure 3a is part of Glen Affric represented on the OS 1st Edition from the 1860's, and 3b a recent aerial photograph. These images show a continuity of openness of woodland cover between the two dates. This technique can also be used to help identify shieling sites, as many of their characteristic features such as wood pasture with veteran trees and good grassland can be readily identified from the aerial photographs.


3a.



3b.

Figure 3. Comparison between OS 1st Edition 1860's (3a) and Aerial photograph 2005 (3b) – Glen Affric.


## 1.2. Glenmore and Stratha'an

A different form of transhumance took place in the Glenmore and Stratha'an case study area. This was the end point of an important long distance transhumance into the Cairngorms from the Morayshire plains and was used to move cattle up to the summer hill pastures/shielings since at least the eleventh century (Ross 2004).

New research into the landscape history of Moray has demonstrated that early medieval land divisions or "davochs" evolved to ensure the fair allocation of natural resources such as wood, salt-water fishing, arable land and high mountain grazing between parishes. This must have been a difficult process and a small number of davochs in medieval Moray did not contain or appear to have direct access to mountain grazing. Equally, there were two medieval parishes which contained large areas of high ground that never belonged to any particular davoch: the forests of Stratha'an and Glenmore. Surviving records indicate that there were as many as 180 shielings in Stratha'an between 1585 and 1616, with up to 3000 cattle being summer pastured there in 1746, presumably driven up from the parishes along the east coast of Moray. The records show a similar pattern for Glenmore. This means that the systematic and organised exploitation of natural resources, together with their management, at least in this part of Scotland, is probably at least 1000 years old (Ross).

The woodland cover of Glenmore and StrathA'an can be traced back by looking at the historical maps of these two areas and tracking changes in woodland cover over time. Timothy Pont carried out one of the earliest detailed surveys of Scotland in the late sixteenth century. The manuscripts he produced were subsequently used for the first atlas of Scotland (Blaeu, 1654) and by Robert Gordon and his son James for the manuscript maps they produced between 1636-1652.

Figure 4.
Gordon map Showing open woodlands of Glenmore and Strath A'an.
c) National Library of Scotland

These early maps seem to confirm the historical open-grown structure of the forest (Smout 2006) e.g. the use of scattered tree symbols shown on Robert Gordon Maps (see Figure 4) and some of the woodland descriptions by Pont. The next comprehensive mapping of Scotland was the Military maps of General Roy in 1755 following the Jacobite rebellion of 1745. The Roy maps also show a more open woodland structure in Glenmore than the adjacent forest at Abernethy, and although the woodland cover at Strath A'an already appears to be declining, it too shows this open woodland structure (see Figure 5). By the time of the Ordnance survey 1st edition maps of 1860 the Moray transhumance had ceased, the clearances had taken place and there were dramatic changes in land-use. Glenmore was now under forestry while Strath A'an was used for sheep grazing. Remnants of the open pasture woodland with its associated species-rich grassland – a product of an historic land-use system may still be found in both areas. Nowadays, however, individual veteran trees originating from this former land-use within each area are equally isolated from each other either within commercial forestry or on the open hill.

5a.

5b.

Figure 5. Showing OS 1st Edition maps of Glenmore (5a) and Stratha'an (5b) showing contracting woodland cover as a result of change in land use post Highland Clearances

The vegetation of Stratha'an is strongly influenced by the base rich soils/limestone outcrops, which would have provided high quality grazing pastures along the old transhumance route or drove road. Today, tiny remnants of mixed ash woodland cling to the boulder scree out of reach of grazing animals on the valley sides, but historical maps suggest a formerly much more extensive woodland cover with some areas of wood pasture, which were probably strongly connected to the use of the drove road. These areas of open woodland with associated pasture along the length of the transhumance route where the cattle could be "stanced" overnight would have been highly valued, and important elements within the system.

## 1.3. Rhidorroch

This third study area has been chosen to illustrate another slightly different form of transhumance and its impact on the structure and distribution of associated woodland. The cattle droving trade which came to play an important part in the life of the country between the start of the sixteenth and middle of the nineteenth centuries involved the export of cattle from upland areas to organised markets in the lowlands. A combination of the climate and physical nature of the Scottish Highlands made them a natural grazing area and increasingly as time went on, cattle breeding became confined to the hill country. The reason for the transhumance was because of the need of the poorer north-west districts to export their beasts in the absence of available feeding to carry them through the winter. Rhidorroch lies just behind Ullapool, and on a droving route which linked the outer islands to the mainland of Scotland (see Figure 6 overleaf). Even within living memory, cattle from the Isle of Lewis were still being regularly landed at Ullapool, from where they would be driven through Rhidorroch and Glen Achall to the late autumn sale at Ardgay (Haldane).

It is suggested that Rhidorroch would have been used as a holding area for livestock arriving or departing the outer isles and markets elsewhere in Scotland, and that this land-use has influenced the development of the vegetation of the glen. The passage and pasturage of large droves of cattle meant valuable manuring of the ground, and even to this day the routes of old drove roads and sites of (overnight) stances remain in many places appreciably greener than the surrounding hill (Haldane). Limestone and base-rich soils influence the vegetation in the lower part of the glen, where there is good quality pasture. Fertile soils are generally scarce in the Highlands, and therefore it is likely that they would have ordinarily been cultivated. The presence today of such extensive wood pasture here, with open-grown veteran alder trees dating back several hundred years to the cattle droving period suggests the importance of the area for grazing livestock. The 1st edition Ordnance survey maps (1860) show extensive areas of wood pasture, which are still present today on the valley flats.

Although the droving trade developed over a period of about 300 years, it would have operated concurrently and did not exclude the smaller scale transhumance described previously. Therefore in some areas it is likely that animals were moved up to summer pastures for fattening and would then have been walked off on the drove roads in the autumn for sale in the lowlands.

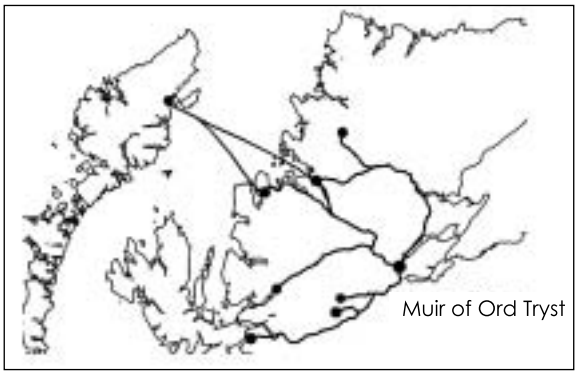



Figure 6. Drove routes in North-west Scotland

The combined evidence therefore suggests that the woodland cover of these areas has long been characterised by an open structure which has evolved over hundreds of years and is characteristic of grazed woodlands in a pastoral landscape.

## 2. Discussion

The increase in number of large-scale ecological restoration projects in Scotland in recent years reflects the increased awareness of the importance of landscape ecology and a move away from site-based conservation strategies. This approach to ecological restoration allows a range of different woodland structure types to be incorporated in recognition of the historical origins of the landscape. There are biodiversity benefits in this approach with an increase in niches as a result of the diversity in structure types. Veteran trees, and especially open-grown veteran trees, can be seen as keystone structures providing both ecological connectivity and continuity and as focal points for landscape restoration. Maintaining the balance of their populations should be seen as a measure of success in landscape restoration.

Investigation into historical and ecological records has shown that the extent, structure, distribution and composition of these woodlands have evolved as a result of both anthropogenic and environmental influences. Many of these woods have historically, and possibly longer, had an open structure because these woods have long been managed as wood pastures, and this paper has attempted to show how an intensive pastoral land-use of the Scottish uplands over hundreds of years has influenced this. It is unlikely that upland forests in Scotland will be in a dynamically stable state in the future due to climate and policy change. This suggests that there should be no specific historical point of reference for ecological restoration but rather an ecologically functioning landscape, with a wide range of tree species and structures, that is able to adapt to any future changes. This will require a range of management options to deliver the mosaics of habitats and woodland structures.

One of the challenges for conservation in the Scottish highlands is getting the right grazing in the right place at the right time. Changes in the way farming subsidies are delivered or will be delivered has lead to uncertainties within the farming community and there are concerns that this will result in a reduction of grazing animals in upland areas and abandonment of small-holdings. The inception of a twenty-first century transhumance may be the tool that addresses this grazing issue and the management for the restoration of these cultural landscapes. This would mimic the long distance movement of animals from lowland habitats to upland habitats that require conservation grazing. It would also contribute to the development of ecological networks with lowland meadows linked to upland pastures and grazing animals moving through the landscape.

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# Working landscapes or recreational showcases – sustainable forest management and the implications of cultural knowledge loss

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## Abstract

Forest landscapes reflect and influence community cultural history. Palimpsests of archaeology they bear testimony to uses some sustainable, others not. Evidence relates to both woodland and non-woodland uses. Intensive studies in the UK show the depth of evidence and the diversity of interactions between people and their woods. Understanding of the nature of these landscapes and of the drivers that shape them has changed radically over the last twenty years. During the 1980s interest in ancient woodlands in Britain grew with the research and writing of woodland and forest enthusiasts such as Oliver Rackham (1980, 1986), George Peterken (1981, 1996) and a few others. This re-kindled an interest in the unique histories and values of forested or wooded landscapes. Sheffield in South Yorkshire, England makes an informative case study. It has around eighty to one hundred ancient woodland sites managed for around 700-800 years as traditional coppice-with-standards woods. Forest products included timber for construction and underwood to make charcoal and whitecoal for metal smelting and working. These woodlands literally fuelled the region's industrial revolution, providing both energy and materials. This declined from around 1850 to perhaps 1910, when they were converted to high forest plantations and ultimately local authority-owned, amenity woods, many locked into the urban area.

## 1. Introduction and the Sheffield Case Study

The loss of traditional coppice woodlands was quite rapid. From the mid 1800s there was piecemeal conversion to plantation high forest by owners of large estates, and the loss or abandonment of sites to either urban spread or farming. This continued until the 1920s and 1930s as many woods fell to urban development, were abandoned, or passed to local authorities for recreation and amenity. From the 1920s to 1980 local authorities purchased many ancient woods for community benefit. Until the 1990s these were managed by a substantial workforce in part for commercial exploitation. Many woods were converted to coniferous plantations, and extensive new conifer forests planted. Remarkably, by the 1970s there was almost no local memory of their traditional uses, functions, or origins.

By the late twentieth century local cultural memories were of the now commercial, plantation, high forests not of the traditional coppice woodlands. Despite photographic evidence of traditional charcoal burners working the woods in the early 1900s, local people had lost all knowledge after fifty years or less. It was the same with associated local woodland crafts and workers; making baskets, clogs, beesoms, and hurdles, and others like tanning. The imprint remains in place-names and family-names but not in the community itself. By the late 1970s in Sheffield, local people including foresters and other woodland managers thought no woods in the district were ancient. All were believed planted over the last 200 years. One reason that local people did not recognise the antiquity of their woods was the absence of big trees. In their minds they associated 'ancient woods' with large veterans and as a consequence of centuries of industrial coppice, most of these have gone. Since for the public ancient trees are big and impressive, in Sheffield there are very few so obvi-

ously these woods cannot be ancient. Yet palimpsests of archaeological evidence bear testimony to their usage, sometimes sustainable, other times not, over the millennia. The impact of the cultural uses is deeply embedded in the forest landscapes, with dramatically altered the ecology, hydrology, and pedology; an archaeological resource of huge interest. Throughout the period 1960-1980 approaches to site management reflected this lack of awareness of antiquity and history.

Research and detailed site case studies have dramatically altered contemporary understanding of these cultural landscapes, with similar trends across the UK. Scoping work and information exchange across Europe and the USA, suggest close parallels. There is interest in both conserving and in re-creating past uses, at least for demonstration purposes. In today's landscape these woods and forest are recognised as of immense social and economic value, but recognition of their cultural significance is limited. This results in lack of protection for archaeology, and low awareness of changed soils and vegetation from the 'natural' forest. '*Working*' and other culturally significant trees are frequently over-looked and mismanaged. These are cultural landscapes and the future vision of Europe's forests must recognise this.

It is important to recognise, identify, and assess typical processes and landscape evidence, with factors of regional distinction of great interest. Across Europe there is excellent research, and findings need to be shared and used to foster wider appreciation. This generates recognition of the importance of forest archaeology and history and informs visions of a future sustainable forest landscapes. This process would be supported by the proposed *European Cultural Forest Network.*

There are key issues such as the degree to which these woods are natural. It is increasingly obvious that they are not, but many people think they are. They now think that ancient woods link to primeval forests and there is a legacy of misinformation, such as a loose quote from an early 1900s introduction to forestry: '*…Our forests and woods today are pretty much as they would have been 15,000 years ago*'. Furthermore, ancient woodland plants, such as the Bluebell (Hyacinthioides non-scriptus), one of the UK's most iconic plants may tell a subtly different story from that usually assumed. Occurring in dense swarms across former coppice woods it probably reflects succession to high forest, abandonment of medieval management, and replacement of a more diverse community (Vickers and Rotherham, 1999). Forested landscapes reflect the cultural history of their communities.

## 2. Methodology

The research approach combined long-term field study sites (on both archaeology and ecology), social case studies, archival materials, and oral histories. These were placed in a context of social, economic, and political changes and drivers over the period considered. The results of the detailed case study at Eccesall Woods in Sheffield are presented in Table 1.

## 3. Results

### 3.1 Drivers of Change and a Shared History

In the 1980s a new appreciation of woodlands and especially ancient woodlands emerged. But what does this mean in terms of conservation and continuity of management? Understanding of the nature and drivers that shape these landscapes has emerged and changed radically over the last twenty years. Rotherham and Jones (2000) discussed some of these for South Yorkshire. It is important to recognise these drivers and their impacts for future sustainable management of wooded landscapes. Similar trends and evidence have now been identified across Europe and

North America; with differences in detail, but common underlying principles. But there are still serious issues of limited recognition of the cultural significance of the forest landscape. This results in a lack of protection for archaeology, and low awareness of changed soils and vegetation from the 'natural' forest. '*Working*' and other culturally significant trees are frequently overlooked and mismanaged.

Table 1. An Example: Post-Domesday Ecclesall Woods, Sheffield: a selective timeline

| | | |
|---|---|---|
| Pre-1300 AD | Farmed agricultural landscape close to open heathy commons and riverside meadows. | Wet and streamside woods. |
| 1317 AD | Robert de Ecclesall – granted licence to impark the area. Hunting of deer and other game including a rabbit warren. | Enclosure and grazing – pollards?? Laund for grazing; tracks and routeways through the landscape.<br><br>Probable survival of veteran tress and dead wood. |
| 1500s–1600s | Industrial coppice-with-standards for underwood – whitecoal and charcoal; and for timber. Whitecoal and charcoal needed for lead smelting and other metal-working. | Probable introduction of rare shrub, Alder Buckthorn, associated with coppice.<br><br>Massive drainage and de-turfing to cover the charcoal clamps. Associated loss of woodland flora to woodland edges and wet areas.<br><br>Loss of deer species. |
| 1700s-1800s | Changing technology in lead smelting; loss of need for whitecoal manufacture, continuing industrial charcoal production.<br><br>Surface mining of mineral coal. | Introduction of some Sweet Chestnut??<br><br>Heathland vegetation and fauna widespread. |
| Mid-1800s–1900s | Extraction of ganister for furnaces and smelting industries.<br><br>Creation of wooden-tracked railways.<br><br>Continuing drainage and decline of coppicing with replacement by Victorian High Forestry. Introduction of Beech (Fagus sylvatica), Sweet Chestnut (Castanea sativa), European Larch (Larix decidua), Scot's Pine (Pinus sylvestris).<br><br>Theft of Wild Daffodils (Narcissus pseudonarcissus), Snowdrops (Galanthes nivalis), Primroses (Primula vulgaris) for sale and gardens. | Progressive closure of canopy, and so decline of open forest and heath vegetation and beginnings of recovery of ancient coppice wood ground flora.<br><br>Deliberate and accidental introduction of exotic trees, shrubs and herbs, including Rhododendron ponticum and Prunus laurocerasus.<br><br>Significant heathland element remaining in flora and in bird fauna by early 1900s. |
| Early-Mid-1900s | Massive air pollution with fallout of around 3.35 tons of grit and grime deposited per square mile per week in 1920s.<br><br>Consequent acidification of remaining soils.<br><br>Urbanisation and severance by major roads.<br><br>Establishment of Bird Sanctuary as the region's first nature reserve. Set aside for zero management and no access.<br><br>Major threat of loss of most of site (perhaps 80% of the 100 hectares), for urban development. | Deliberate planting in woodland compartments of exotic Sycamore (Acer pseudolatanus), and then later of Norway Maple (Acer platanoides) along roadsides.<br><br>Continued recovery of woodland flora but also increasing occurrence of garden escapes and introductions: Himalayan Balsam (Impatiens glandulifera), Variegated Yellow Archangel (Galeobdolon argentatum), Narcissus var., Spanish Bluebells (Hyacinthoides hispanica). |
| Mid-1900s–late 1900s | Continuing urbanisation and threats of felling and 'parkification' (1970s). Proposed felling and re-planting with exotics for 'amenity'.<br><br>Many more visitors and dog-walking.<br><br>Increased atmospheric fall-out from road traffic but declining smoke pollution from industry and housing. Assumed increase in nitrogen levels in soils.<br><br>Increased in micro-disturbance and fly-tipping of litter, plus encroachments into woods by adjacent domestic gardens.<br><br>Closure of local authority-owned Sawmill. | Spread of exotics, and recovery of ancient woodland ground flora. Increase in high forest birds and loss of open forest or heath species.<br><br>Spread of Sycamore and then later of Norway Maple.<br><br>Loss of dead wood as a tidiness measure. |

| | | |
|---|---|---|
| Late 1900s–early 2000s | Establishment of local community 'Friends Group'. Experimental conservation management.<br><br>Glades plus non-intervention areas, and then experimental coppice.<br><br>Footpath, access and interpretation work.<br><br>'Weed' control.<br><br>Still getting drier!!<br><br>Recognition of historic landscape and its importance.<br><br>First funded research programmes and development of management plans. Abandonment of experimental coppice after less than 10 years. | Continued spread of exotics, and recovery of ancient woodland ground flora. Loss of Elm (Ulmus sp.) to Dutch Elm Disease.<br><br>Further spread of Sycamore, Norway Maple, Sorbus sp., and High-clere Holly (Ilex).<br><br>Decline of some exotic plants in some areas due to selective controls. |
| | | |
| | Major threats averted – here but not elsewhere | |

## 3.2. Ecological Trends

There have been major shifts in the ecological dynamics of these sites, associated with several different phenomena:

- Eutrophication from atmospheric nutrient fallout and decreased limited removal of biomass compared with a coppice wood;
- Successional change following canopy closure, competitive effects, lack of micro– disturbance but often macro-disruption;
- Removal of topsoil and vegetation for charcoal manufacture;
- Decline in dead wood components and of associated species;
- Response to long-term trends of environmental change;
- Inevitable urbanisation impacts;
- Socio-ecological impacts with planted trees, theft of attractive herbs, and introduction of garden throw-outs, plus nutrient inputs.

## 3.3. Hydrological Trends

All the woodland areas considered are suffering from desiccation and drought, with a number of causes.

- Internal drains that are often still active and still desiccating;
- Urbanisation and water theft with woods often isolated islands of habitat;
- There is much talk of hydrological sustainability in both urban and rural areas, but this is little more than policy statements. Continued trends threaten wooded landscapes

## 3.4. Cultural Landscapes

A major cultural impact has been the loss of dead wood habitat, standing and fallen, on living and dead trees. After decades as tidy woodlands sites are depleted compared with natural forests. Victorian foresters and then twentieth century amenity woodland managers liked clean, tidy woods; so do many members of the public which is bad news for dead wood, wildlife, and history. It is worth considering how medieval woodland, the cultural forest, would compare. Con-

temporary (50-150 years) economic management of woods generally leaves them impoverished in terms of dead and decaying wood, so the regional woods are depauperate in dead / decaying wood resources. These are probably reduced to less than 5% of that in '*natural woodland*' and less than 15% of that in traditionally managed woodland. More recent concepts of the nature of traditional forest may push these figures even lower. The *Sheffield Nature Conservation Strategy* (1991) noted the rarity of trees over 200 years old in Sheffield. Developing ideas in the *Sheffield Woodlands Policy* (1987) it stated that the Authority would continue to implement policies and proposals set out in this policy. In particular the Authority committed to active support for the EEC Committee of Ministers Recommendation No. R (88)10 '*On the Protection of Saproxylic Organisms and their Biotopes*'. This was a European priority target for conservation to which the City Council and other local authorities committed. Since then there has been only limited action in support of this objective. There have been sporadic moves by some local authorities to maintain dead wood with both fallen and standing trees, and brash piles left after forestry works. However, overall there is limited application of these approaches at a wider level. Promoted by local entomologists non-intervention zones were identified and agreed in the *Sheffield Woodlands Policy* (1987) but seem to have fallen from favour.

Early accounts confirm that the landscape was once far wetter, and that owners and managers of woods in the 1700s and 1800s were obsessed with drainage. Owler Car Wood in the Moss Valley, and Ecclesall Woods, are examples with extensive drainage networks, and both are now substantially desiccated. De-watering continued through the 1900s and the period of amenity woodland uses, with added and catastrophic impacts of urban development and intensive arable farming. As yet there are no attempts to remediate these impacts.

These changes have been compounded by massive removal of soil and vegetation for industrial coppice and charcoal manufacture. In the cultural forest we see the woodman through the trees such as relict coppices, and in soil, vegetation, and lack of water. The woodman has left an indelible imprint on the woods, along with loss of soil and loss of water. These are cultural landscapes and the future vision of Europe's forests must recognise this

## 4. Conclusions

Where does this leave these cultural, semi-natural landscapes? It is important to recognise, identify, and assess typical processes and evidence in these landscapes. Factors of regional distinction are of particular interest. Across much of Europe excellent research is being carried out, and it is essential that findings are shared to foster a wider appreciation of the resource. Modified for economic use the woods have been and managed often continuously for decades and sometimes centuries. Some of the oldest trees are smaller species such as Holly clones or Rowan coppices; not what people expect to see. Relicts of former management, a '*singled*' coppice or '*elephant's foot*', are unique archives of woodland and landscape history, but easily removed and lost through uninformed management.

Sheffield is now famous for its old woodlands, but it has few obviously veteran trees, and this still causes confusion; for in old woods, people expect old trees. The region's woods were mostly managed as industrial or rural coppice-with-standards; worked, used, and extracted. Veteran trees might survive on boundaries such as trackways, and outside the woods, in parks and on commons. Remaining woods are often affected by conversion to Victorian high forest, with exotic species; and then neglect or planting with conifers. Many old trees were lost through management, and then Dutch Elm Disease, and in urban areas vandalism, removed many others. What remains reflects these impacts through time.

### 4.1. The Grass Snake's Tale

The Grass Snake *(Natrix natrix)* is an interesting species, local and uncommon in Sheffield, a Local Red Data Book Species. At Ecclesall Woods it is at its western stronghold in the region probably because of the open, sunny nature of the former coppice woods, and associated warm piles of bark and woodchip. In this case it is an 'indicator' of the medieval, working coppice wood. Highlighted as important for action in the draft site management plan produced in the 1990s, with the experimental coppice now abandoned its future looks bleak. This parallels declines of open–wood bird species described by Medforth and Rotherham (1990).

### 4.2. Difficult Issues

The long-term impacts of management on hydrology, deadwood, and soils present huge problems for future conservation. Non-natives such as Highclere Holly, Portuguese Laurel, Sweet Chestnut, Swedish Whitebeam, and Variegated Yellow Archangel raise issues and prove controversial. There are basic questions of what to do, why, when and who decides? Science and history inform but decisions are inherently subjective. They may be valid but are a choice that we make. How do we conserve the ecology and the imprint of human activity in the past, but maintain the dynamic stability of these cultural landscapes? This challenge is in the face of the fickle nature of human whim and fashion, and the vagaries of funding.

### 4.3. Recognition and Future Vision

For the case study sites continuation of archaeology and ecology surveys begun in the 1980s led to a radical change in perceptions. The initial findings were not believed by local archaeologists since the local Sites and Monuments Record 4-5 records for the whole of Ecclesall Woods and the surveys indicated in excess of 1,000. Ardron and Rotherham (1999) identified a very major resource in Ecclesall Woods, with features dating back over 3.5 thousand years. This revolutionised the perception of these landscapes. Rotherham and Avison (1997) (Owler Car Wood), totally changed perceptions and conservation management.

Recognition of the resource is hugely important, and becomes urgent as time passes, memories are lost, and management tends towards either abandonment or intensification. This is needed in order to evaluate the importance of forest archaeology and history, and to inform visions of a future more sustainable forest landscape. This process of recognition, evaluation and assessment will be supported by the proposed *European Cultural Forest Network*, launched at the Florence 2006 meeting.

### 4.4. Contemporary Management

There remain serious problems in relation to contemporary woodland management. Sites have often been abandoned for decades and when management is brought in the impacts may be undesirable or unpredictable. It often fails to take account of the history of site management, or the consequences of often deep-seated ecological trends. The context of the woods is often radically changed from times past; they may be urbanised and fragmented, or isolated within intensively-farmed rural landscapes. The soils, archaeology, working trees, and vegetation are a precious resource, an ecological archive. Through pits and platforms, soil profiles and sediments, plant indicators, banks and ditches, trackways and roads, this tells a story of land-use and human activity.

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# European Landscapes and Forests as Representations of Culture

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## Abstract

European forests and landscapes bear witness to cultural processes and developments, and show evidence of the impact on their existence of numerous, constantly changing human needs. The shaping and re-shaping of forests and nature over the centuries is the result of private and public land management decisions that are taken against the background of the predominant cultural values, ethical convictions and societal trends. They are extrapolations of contemporary visions based on traditional knowledge and aesthetics from the past, as interpreted in the present. Understanding this legacy and acquiring more information about it and awareness of it through interdisciplinary research will lead to new insights. The information and awareness that will be generated with this approach are essential to allow more appropriate decisions to be taken, setting present-day cultural competence and practical responsibility in the context of environmental decision-making.

**Keywords:** environmental decision-making, cultural values, European cultural landscapes, simulacra, palimpsest.

## 1. Introduction

Natural environmental conditions and processes of cultural development have determined the spatial distribution of forests and the intensity with which forest vegetation has been influenced by human activity. This applies both to forests that have been exploited and to wooded areas that to all appearances have barely been touched. The reasons for the current delimitation of the forest and of open spaces are manifold: for instance, a particularly high value allotted to forests for social and cultural reasons or, conversely, the lack of economic interest attributed to their use in the past. Differences between intensively exploited areas and those showing few apparent human interventions depend on social values and needs, political demands and institutional rules, and the usable economic recourses potential. In general, one can say that all forests – including those considered to be forests close to a primordial state – have been and still are spaces manipulated by man.

## 2. Cultural processes shaping forests and landscapes

Landscapes and large forests are holograms of a complex historical continuum in their geographical location over time. History reveals itself in landscapes as a man-made configuration of self-referential citations referring to previous historical layers. They are a contemporary amalgamation or palimpsest of the past as viewed at present. Societies can neither abstain from shaping landscapes and forests and transforming natural resources, nor can they fail to perceive and interpret them. And the way in which landscapes are perceived and interpreted at present always includes the information about their historical development that is encoded in their physical shape, their history and their cultural memory (Harrison, 1992; Seeland, 1993; Schama, 1995).

The various layers of temporal representations of culture as distinct geographical locations are sediments that have become inseparable over the ages. They are a fabric formed from physical ap-

propriations of natural elements such as rivers, lakes, hills, meadows, mountains, agricultural land and forests, on the one hand, and the time-bound testimony of man-made cultural artefacts and their alterations over time, on the other. The bed of a river, for instance, represents its history and culture. It reflects the energy of flowing water, under human command and willpower, developing the material culture of a society at a certain stage of development – driving a water-mill, for example. The spirit of history reveals itself in the water power of rivers in this example. It reveals itself in the nutritional value of fish in lakes or the value of the latter as drinking-water reservoirs, and the extent to which firewood, timber and a wide range of forest products other than wood are used. Landscapes and forests represent natural history in the conditions of specific stages of cultural development. Whatever is appropriated by humankind from nature and transformed into cultural assets becomes visible in a landscape as a specific stage of its material and cultural development.

For millennia, human beings have been influencing the spread of tree species and the botanical composition of forests. During the long history of land use, forest areas have been transformed into fields, grasslands, and wooded pastures; settled areas have been abandoned, returning to fallow land and subsequently to forests again. Varied landscapes have been formed by successions of vegetation that are often still clearly visible today. The present distribution of forest areas and species only partially reflects what the vegetation would be without human intervention. An important indicator of the degree of 'naturalness' of forest vegetation is provided by the current development of soils and herbaceous flora. As a consequence, the wooded areas of Central Europe show a mosaic of varied landscapes, often subject to rapid changes.

The forests of Western and Central Europe have served as local resources available to the whole population, as indispensable raw material and energy resources satisfying growing pre-industrial demands, and as the basis for the development of an industrial forestry and wood-processing sector based on sustainable wood production (Hauser, 1972; Hasel, 1985; Corvol, 1987; Mantel, 1990; Cavaciocchi, 1996; Schmithüsen, 2005).

The use of the forest as a local resource complementary to agricultural production, meeting many everyday needs and providing essential components of nutrition, has characterized landscapes in numerous ways. It has, for instance, favoured the preservation of deciduous forests, particularly stands of beech and oak, and of mixed forests in the neighbourhood of villages and towns. Forests in the past were less dense than they are now, due to intensive use. Traces of agroforestry and silvopastoral systems are still visible in many landscapes. The vegetation that developed under the influence of diverse forms of historical exploitation such as pollarding and lopping, gathering of fodder, stripping the bark from oaks, the use of the forest litter, and the roaming of stray cattle in the forest is often perceived by people today as something attractive, representing a state close to nature. It is worth remembering that such forests have for a very long time been influenced by humans, who have considerably modified the selection of species, the structure of the stands, and the edaphic conditions. These forests, in the same way as the stands that succeeded them, reflect the social and economic needs of the past.

The separation between the systems of agricultural production and forestry that is clearly visible today developed gradually after the beginning of the modern period. The trend corresponded to demands on the part of reformers in the agrarian sphere for an increase in agricultural yields through intensive use of arable land and pastures. Forest management followed this process. Ways were sought to limit factors harmful to the development of forests and to create more favourable conditions for increased timber production. In both cases, this led to severe consequences for the structure of the landscape and the diversity of species. Biotopes that had developed within the framework of mixed exploitation disappeared or at least lost ground, either in agricultural zones or

in the forest environment. The separation between areas of arable land, pasture land, and forests has been one of the major factors in landscape changes.

From the 15th to the 18th centuries, large-scale wood exploitation developed, combined with systematic exploitation of the more accessible areas, in order to satisfy the growing pre-industrial demands for energy and raw materials. The importance of wood required for the development of new technologies and production processes indicates the major role it played up to the industrial revolution at the beginning of the 19th century. The economic potential of forests was asserted by various interest groups, often in contradictory ways. The greatest divergence was between demands by the local population to be able to take advantage of the forest for their own needs and the endeavours of sovereigns and local landlords to lay their hands on new exploitable wood resources in order to procure revenue and supply factories and long-distance trade. Until the 19th century, this divergence was apparent in the prolonged and serious conflicts that took place over user and property rights. In addition, there was increasing competition between the use of wood for energy and the demands for timber by craftsmen and pre-industrial enterprises. There was also a strong rivalry between towns, which wanted to safeguard their annual wood supplies, and private entrepreneurs prospecting for accessible new resources.

The immense demand for wood as a source for energy and raw materials for villagers and citizens, for pre-industrial mining and metallurgy, for salt and glass production, and for long-distance trade for shipbuilding and port installations, led to the systematic exploitation of forests in many European regions. All of this resulted in landscape changes that can still be observed today. Large-scale and concentrated felling not only changed the forests exploited at any given time; it had severe consequences on the structure and composition of forest stands that developed naturally or were reforested after clear-cutting. Deciduous forests and mixed forests retreated in regions such as the Harz Mountains, the Black Forest, and the Alps, where there was a particularly high, concentrated, and long-term demand for wood for pre-industrial processing; and consequently coniferous species, mainly spruce, superseded beech. The spread of other tree species, such as fir, was also influenced to a lesser extent. Where logging concentrated on large-scale selective cutting, such as for shipbuilding and the long-distance timber-rafting trade, more differentiated tree stand structures and species compositions were, at least partially, preserved.

Over the course of three centuries, starting at the beginning of the 18th century, forestry and wood processing became productive sectors of the economy, using a renewable resource in a sustainable manner as a basis for business management. This development was based on scientific models that allowed harvesting intensities to adjust to the long-term potential of forest sites, species composition, age classes, and forest stand structures. The most important aspect was probably the regeneration of forests over large areas and the management of uniform stands. In the plains and lower mountains, the introduction of sustainable wood production during the 19th century quite often favoured an organization of stands by predetermined periods of rotation, allowing the regeneration of clear-cut areas. Seeding of conifers and large plantations of spruce or pine allowed the afforestation of exploited and devastated surfaces in which natural regeneration was difficult or even impossible at this period. In general, conifers were systematically promoted because they corresponded to economic purposes, according to which the thinning and final felling of even-aged stands allowed a rapid increase in wood production. In the Alps and, to a lesser extent, in other mountainous areas of Central Europe, the practice of selective logging combined with natural regeneration continued to be a traditional practice, which has in the meantime developed toward various forms of silviculture that are close to nature, such as selective cutting and regeneration in small areas.

### 3. Local landscapes and global identification

During the 20th century, the transformation of agrarian and industrial societies into service-oriented and globally oriented societies broadened the public's view of the meaning and value of forests. Their role as water storage areas, biodiversity parks and carbon sinks has become increasingly relevant. Landscapes and forests are being increasingly valued for their environmental services at a higher level of political relevance. The integration of forests into the European Landscape Convention, for instance, has given them a new significance that combines several important functions that they have in modern societies. The environment, although it remains locally significant, is tending to be appropriated on an increasingly global scale. A reversal has occurred in the palimpsest of layers of significance that have been prominent for so long among the sediments of cultural meanings; earlier meanings are now being superseded by others that have risen to greater prominence due to increased environmental awareness of the population.

A preponderance of recreational uses in natural landscapes and forests over other uses has developed along with the emergence of service-oriented societies. The value of natural environments has been upgraded as modern lifestyles have become more and more separated from natural ways of life. Modern citizens, who rarely have any contact with nature and forests in their ordinary professional lives, acknowledge the environmental importance of forests and identify themselves with political and economical initiatives to safeguard them in order to stabilize the climate all over the globe. Local environments are tending to become increasingly meaningful at the global level rather than at the local one, as many extra-local world citizens identify themselves with localities other than those where they reside. Tropical forests, for instance, have become a relevant political issue in the environmental politics of non-tropical countries.

What forests mean at the present time to the population, landowners, and specific user groups has become an interesting and topical subject of research. Empirical studies on people's perceptions and attitudes to forests and forest management provide information about the development of their social significance (Schmithüsen et al., 1997; Rocek, 1998; Jensen and Koch, 2000; SAEFL, 2000; Schmithüsen and Wild-Eck, 2000). The findings indicate, first of all, that for most people the forest continues to be a usable and productive part of the environment and that its management is notably conditioned by economic preferences. On the other hand, it can also be stated that for a growing part of the population, forests represent a free space for recreation that is different from other widely transformed parts of the landscape. At the same time, forests are identified more and more as a primordial natural environment, perceived by many people to be subject to little or no human influence. Forests represent the free interplay of natural forces, in contrast to inhabited areas and surfaces intensively exploited by agriculture. This new development reflects the needs and attitudes of contemporary society and crystallizes the desire on the part of an ever more urban population for recreation in natural surroundings close to cities. It reflects concerns provoked by the impending threats to the environment and to biodiversity, resulting from personal experience and sensitivity toward global-scale phenomena. It is founded on the individual values of a large number of people for whom the forest represents a place for meditation, reflection, and freedom.

The motives of the interviewees vary depending on individual preferences and on their social and economic conditions. They usually emphasize that the forest is a place where one can walk, practice various sports, study nature, or breathe and relax; and a place where one feels happy and can reduce the stress of everyday life. The survey results underline the importance of the forest as a place to which one can withdraw and express one's love of nature, as a quiet place for personal reflection, and as a realm of physical and emotional experiences and sensations. While visitors to the forest come for many different reasons, many of them are attaching increasing importance to emotional,

spiritual, and mystical values. Contradictory expectations and demands thus affect today the use of forests and forestry management. For town dwellers, the forest above all represents a favourable area for leisure and relaxation. Inhabitants of mountain regions see it as a protection against natural hazards and as a tourist attraction. For forest owners it is an important source of income, and for the wood processing industry forests provide the elementary raw material resource base. For one part of the population, the forests are unique, and the necessity to conserve them predominates. Another part considers that the economic aspects of wood production in providing employment and a source of revenue are preponderant.

Sustainable forest management – which in European forestry developed over centuries, gradually following profound cultural dynamics in society – started from specific local patterns of use of forests in early history, and narrowed down to a focus primarily on wood production in order to procure state revenue and extensive profits during the industrial age. It has only been in recent decades that it has again come to include a wide range of other non-wood forest uses and social values. In a modern management-oriented definition (Speidel, 1984), sustainable forestry means the ability of landowners and land managers to produce wood, infrastructure services, and other goods for the benefit of present and future generations. In a locally specific combination, it can fulfil the prevailing demands for private and public goods and values and corresponds to the long-term physical potential of forest sites and forest stands. It means maintaining and creating the entrepreneurial conditions necessary for a permanent and continually optimal fulfilment of economic and extra-economic needs and goals.

While land-use conflicts were previously at the fore, the very purpose of the forest and the way it is currently managed now dominate the major part of debates about the relationship between humankind and the environment. Different fundamental concepts and management systems, with their distinct emphases, have now come into the focus of the political debate. In the light of the increasingly pressing demands for environmental protection and conservation of biodiversity on a large scale, it is not the principle of sustainable wood production that is in question, but certain forestry practices that are judged to be incompatible with sustainable development. From this point of view, a forest economy that is capable of taking account of emerging new currents of opinion in society, based on cultural change, will benefit from the approval and acceptance of the population. The sustainability concept in the modern and largely global view of forest and landscape management implies a time perspective of permanence and continuity, distinct activities such as maintenance and creativity, objectives for meeting new needs and goals, and qualifying criteria for optimal results in the form of sociocultural achievements.

## 4. Cultural foundations of environmental decision-making

Landscapes and large forests that have been shaped in a particular historical era do not replace each other when each era comes to an end and another takes over. The spirit of a new era transforms them only to a certain extent. The relics and remainders of earlier epochs, with their distinct forms of production, survive and can still be detected today. Historical information is the key to deciphering the enigmatic totality of cultural landscapes. This palimpsest of layers in landscapes and forests, as witnesses of the history of mankind, consists of sediments. Investigations can scratch these virtual layers here and there and occasionally bring to light citations of earlier representations of culture (Seeland, 1997). A landscape observer's historical awareness can detect and interpret the manifold material and cultural relics of earlier times that can be seen in landscapes and forests and bring them to the surface of contemporary attention in society. In this way, it can become relevant to political and policy-making discourses.

Observation and reflection against the background of local experience and scientific knowledge allow introspection into this palimpsest of the spatio-temporal layers of visible cultural history. Observation, perception and interpretation of landscapes and forests can unify the information available about the different strata and can contribute to the establishment of a synoptic view and a holographic understanding of the phenomena. The knowledge of past land uses and management objectives enables us to understand landscapes as representations of local history and a succession of cultural developments. With their distinct elements, such as rivers, lakes, forests etc., they have been subject from time immemorial to social and political changes. More often than not, these changes have been caused by regional, national or global political and socio-economic factors. The governing ideas of the past that shaped the development of the modern forest economy, developing as a function of changing needs, are quite often in contrast to the significance given to today's forest cover by a largely urban population. To understand present and future options in managing forests and landscapes, one has to be aware of the historical context that has determined the conditions and objectives for using and managing them. One must also be aware of the local and indigenous knowledge that reflects their cultural importance today (Seeland and Schmithüsen, 2000; Seeland and Schmithüsen, 2003).

Decisions relevant to space and spatial planning are generally taken from a sector-defined administrative point of view, rather than in relation to landscapes and forests as such – i.e., in their primordial state of nature. Decision-making on natural phenomena such as forests and landscapes encodes a cultural rationale that does not comprise their entire being, but merely utilitarian aspects of them. Administrative decisions are thus time-bound representations of cultural values that are constantly transformed according to the logic and rationale of politics, economics, natural resource management, etc. Interest-driven alterations of forests and landscapes do not affect their genuine authentic forms, but their simulacra – i.e., their man-made appearances that have been historically shaped to fulfil certain purposes at a specific time. Decisions are always taken on formations that have already been shaped earlier by human decisions. Future decision-making processes in forest and landscape policies need to take this phenomenon into account. As a consequence, an encompassing view requires a holographic approach to decision-making that refers not only to the utilitarian aspects of forests or other elements of landscapes, but also to cultural landscapes in the broadest sense of the term. Perception and knowledge will allow political decision-making on the basis of the cultural origins of the palimpsest and simulacra. The original remains unknown – there are no primordial forests and landscapes left in mid-Western Europe any more, and we have only come to know man-made copies representing facsimiles of them (Baudrillard, 1976).

The principle of sustainability – or, to be more precise, of sustainable development – today represents an imperative dimension for rational decision-making regarding natural resources for the benefit of present and future generations. It is based on the understanding that the present level of consumption and its effects on the environment have to respect an equilibrium that will provide the necessary room for manoeuvre for future options, for a framework of conditions that allow the harmonization of present interests with future potentials. The sustainable use of forests and landscapes is thus linked to concrete economic and technical conditions and therefore depends on fundamental human perspectives and social norms in the same way. Sustainability does not in itself express an intention to use resources; rather, it forces certain social and political communities to recognize their responsibility for management.

If we concede that any social or natural phenomena that we encounter in the world today are the result of many unknown and hardly traceable decision-making processes, the question arises of the way in which the concept of sustainability can shape the future of mankind. The innumerable, multiple and interwoven decision-making processes, in all sectors of social life and environmental

management, which are subsidiary to the concept of sustainability may contribute to remarkable changes in this concept. Although we cannot know precisely what future cultural values may be, they will undoubtedly shape the lives of future generations for as long as the members of the human race are cultural beings. They will continue to be the basis for as yet unknown future social needs and demands.

A recent retreat to somewhat natural lifestyles began in Western Europe in the early 1970s, and no one can foresee at present where climate change and the political prospects of the worldwide green political movement will take the world. For instance, will largely ageing cyber-based societies in mid-Western Europe favour wilderness as their preferred vision of forests and landscapes? Or will there be Thoreau-like 'Walden' individuals or communities who live in the woods, on the one hand, and in cyberspace on the other? What impact these changes may have on European forests and landscapes is certainly an open question. Can environmental policy decision-making based on cultural values take the opportunity to grasp the entire hologram of cultural values, including future dynamic changes, within a perspective of sustainability of this type? Is it in a position to foresee the ways in which culture might induce a transformation in perceptions of nature that will certainly lead to a different form of natural-resource management in the future centuries of post-service societies? What will come then, and will natural resources still play the role they do in today's discourse on political sustainability? Will the future challenges to the forests and landscapes of Europe be mostly or to a large extent due to climate change, and can these challenges be met by environmental policy decision-making with any major effect? In other words, will human society be in a position to decide on the future of forests and landscapes, or will it be the climate as an anonymous super-power that will act as the sum of millions of decision-making processes in almost all the policies we have at the moment in all the world's societies?

## 5. Conclusions

Present-day cultural developments are not only adding an additional contemporary layer of decisions relevant to forests and landscapes on top of previous ones. They also recall earlier meanings and thus evoke the hidden memory of the historic past and make it relevant to decision-making. The heuristic value of the palimpsest model is that the underlying cultural values involved in decision-making are reverted to when a new era emerges. Thus, decisions are never fundamentally new; since they follow a cultural continuum, the rationale underlying them represents the general history of the human mind and spirit, in which humanity transcends its social development to move towards new horizons – but not towards new natural surroundings. Decision-making can be based on new ideas and intellectual concepts, but the natural foundations of forests and landscapes involve pre-existing historic layers, in the same way as the Renaissance referred back to sources in antiquity and thereby superseded the spirit of the Middle Ages. Post-industrial decision-making processes, being participatory, democratic and decentralized, are currently shaping local life-worlds on the basis of global values.

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# Theme 4.
# EUROPEAN INITIATIVES FOR TRADITIONAL FOREST KNOWLEDGE AND CULTURAL LANDSCAPES

## Frammenti di storia forestale da ForEnCarb, progetto pilota della Regione Sardegna per la sostenibilità dello sviluppo e la pianificazione forestale

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### Abstract

ForEnCarb is a pilot project financed by the "Sustainable Development unit" of Sardinia regional administration, with scientific support of Sassari University. The project goal is to promote sustainable development of Seneghe, a local community of inner Sardinia, effectively implementing, through forest planning programs, provisions of the international agreements to "Combat Climate Change", consequent to Italy's engagement in Kyoto Protocol. To initiate on solid grounds the process towards sustainable forest management, the project analysed the social and cultural heritage of the local community and the historical development of its territorial identity. The town of Seneghe (about 2000 inhabitants) is located on the south slopes of Montiferru, the largest volcanic relief of the island. The township (circa 50 km$^2$) is a hilly landscape ranging from 100 m a.s.l. up to almost 800 m, only partly cultivated with olive trees, little vineyards, and few cereal fields. Most of the land is used, more or less extensively, as pasture for cows and sheep. The mountain side of the territory is covered by holm oak *(Quercus ilex)* and cork oak *(Q. suber)* groves. Most of the woodland (circa 900 ha) is a common property where Seneghe residents are entitled, by traditional rights, of so ancient origin that it is practically impossible to trace it back, to collect wood, to hunt and to access it with their cattle.

As a preparatory analysis, in the process of developing sustainable forest management plans, the project devoted specific efforts to understand the township land-use history and the local wood-related cultural heritage. Accessible public achieves (of the Commune, of the forest service and the provincial branch of the state archives) have been extensively sieved to pick out forest and forestry related documents. Collected archive data have been complemented with local and regional publications concerning land use and forest history and integrated interviewing local privileged witnesses. The paper presents the first results with specific emphasis on the evaluation of what is now locally perceived as a traditional "sylvicultural knowledge".

Collected documentation, mainly town council deliberations, ranges across the last century but enlights only fragments of history: a relevant number of documents were lost. Wood withdrawal from the common property is relatively well documented. Before the 1960' only single independent allowances were released answering to particular requests (e.g. to remove trees damaged by a fire). In the last 30-40 years there has been a biennial organised intervention slowly increasing withdrawal intensity. Nowadays intervention economic value is mixed up with sociological reasons. Also allowances for cattle access to the common property are relatively well documented. Detailed analysis of data series covering the last two decades evidence marked intensity fluctuations. Overall averages should be within sustainability levels, localised overexploitations could be easily avoided trough planning. Astonishingly charcoal production, intensively performed at least during the last century (a great number of charcoal burning terraces are still well evident) is barely mentioned. Sylvicultural practices producing the required material are not clear, interviews produced different pictures. Wood fires, a very frequent problem in Sardinia, have affected the area many times and are frequently mentioned in the documents colleted. In comparison to the surrounding territory there is some evidence of the wiliness and capacity of Seneghe community to defend the common property from wild fires. Concluding, common property woods carry a high symbolic value for this community but social

sensitivity concerning wood management practices is not sufficient to produce sustainable practices. No one, with effective management power, can answer the simple but unavoidable question: "How is the wood you are withdrawing today going to be available again for the next draw?"

## 1. Introduzione

### 1.1. Il progetto ForEnCarb

Con la Conferenza tenutasi a Rio de Janeiro nel 1992 la società moderna ha formalmente riconosciuto la necessità di adottare la sostenibilità quale riferimento per lo sviluppo, integrando il progresso economico e rispetto dell'ambiente così da "*soddisfare i bisogni delle generazioni presenti senza compromettere le possibilità per le generazioni future di soddisfare i propri bisogni*". La gestione forestale sostenibile implementa tali principi attraverso: il mantenimento del sistema bosco nel tempo, la conservazione e l'aumento della biodiversità (Ciancio, 1998) e l'interazione del sistema bosco con gli altri sistemi con i quali è collegato. (Bianchi et al., 1995)

Il progetto pilota *ForEnCarb* è finanziato dal Servizio Sviluppo Sostenibile della Regione e, con il supporto scientifico dell'Università di Sassari, intende promuovere lo sviluppo sostenibile nel Comune di Seneghe. Si propone di affrontare, concretamente, attraverso la pianificazione forestale, gli impegni internazionali "di Lotta ai Cambiamenti Climatici" conseguenti all'adesione al Protocollo di Kyoto. (Pettenella, 2006)

L'attività centrale del progetto è quella che sviluppa il dialogo con la popolazione (e nella popolazione), ne documenta l'eredità storico-culturale e cerca di valorizzare le conoscenze tradizionali connesse alle attività forestali. L'indagine svolta è particolarmente interessante avendo riscontrato un complesso intreccio di tradizioni, usi, costumi e leggi non scritte ma ben radicate nel patrimonio socio-culturale locale corrente. L'analisi storica sugli usi civici e sulla gestione passata del territorio di Seneghe mette in luce e ricostruisce le fondamenta di quegli aspetti della tradizione che risultano più direttamente connessi all'uso silvo-pastorale del territorio, contribuendo alla costruzione di un solido quadro pianificatorio (Agnoletti, Scotti, 2004).

### 1.2. Vicissitudini degli usi civici in Sardegna (sintesi da Beccu, 2000)

Il termine *ademplivos*, spagnolo per ademprivili, appare per la prima volta in alcuni documenti aragonesi del XIV secolo relativi, appunto, alla dominazione spagnola, ad indicare i diritti d'uso collettivo di pascolo, di legnatico, di raccolta di ghiande e frutti di bosco. Gli atti d'infeudazione sanciscono questi diritti della popolazione del feudo conferendogli valenza di diritti reali. Il diritto gravava su tutte le aree boscate *(saltus)* indipendentemente dal titolo di proprietà, pertanto era esercitato sia su boschi pubblici, demaniali e comunali, sia su quelli privati. Nel "*Discorso istorico politico legale dei boschi e selve nel Regno di Sardegna*" del 15 Marzo 1800 si documenta che questo diritto è stato ripreso anche in epoca sabauda e coinvolgeva tutte le aree boscate, stabilendo che può operare, "*… in qualunque dei suddivisati boschi e selve, chiunque dei vassalli per gli usi propri o casaleschi, per fabbricare per istrumenti aratori, per abbracciare e qualsivoglia altro uso, che non tagli la pianta alla caspa*".

Successivamente lo Stato adottò diversi provvedimenti tesi a eliminare queste antiche consuetudini, sia come rimedio, dato l'uso sregolato della risorsa forestale conseguente all'esercizio di tali diritti, sia per avere piena disponibilità delle terre demaniali gravate. Il primo fu il Regolamento del 15 marzo del 1839, nel quale all'art. 20 s'indicava la strada da seguire per arrivare all'abolizione dell'uso comune delle terre: "*ove l'estensione dei boschi e delle selve sopravanzi ai bisogni, ed agli*

*usi degli stessi Comuni, ne verranno dal governo assegnati i limiti, in cui continueranno ad esercitarvi i soliti ademprivi*", ciò equivaleva ad affrancare dagli usi comuni una parte del territorio, parte di cui ovviamente lo Stato si riservava la piena disponibilità.

In seguito nel 1863 un importante provvedimento (legge n. 1105) del governo ridusse ulteriormente le terre gravate dagli usi civici. Vennero infatti ceduti, a titolo di sussidio, 200.000 ha di terreni ademprivili alla Compagnia Reale delle ferrovie sarde per la costruzione della strada ferrata che doveva congiungere il nord e il sud dell'isola.

La legge del 23/04/1865 n. 2252 prevedeva che fossero aboliti "*…gli usi conosciuti nell'isola di Sardegna sotto il nome di ademprivi, nonché i diritti di cussorgia…*". Tutti i terreni ademprivili di spettanza del Demanio furono ceduti in piena e perfetta proprietà ai Comuni a patto che, in primo luogo, soddisfacessero le ragioni degli aventi diritto, sollevandolo da ogni sorta di "*molestia di lite o di pretesa*". In secondo luogo i Comuni dovevano impegnarsi a vendere (privatizzare) le restanti superfici entro tre anni.

Infine, con la legge del 2/08/1897, che dispone "*diversi provvedimenti in favore della Sardegna*", tutte le superfici ex ademprivili rimaste invendute, sia comunali sia demaniali, furono consegnate all'appositamente istituita Cassa Ademprivile, oggi Cassa di Credito Agrario. Nonostante tanti provvedimenti, questi antichi diritti sono ancora oggi esercitati con gli usi civici attraverso i quali si fruisce del diritto di pascolo e di legnatico sui territori di proprietà comunale.

### 1.3. L'uso civico a Seneghe

L'uso civico di legnatico e di pascolo interessa a Seneghe la maggior parte del territorio montano, quasi 900 ettari. La "Carta de Logu" documenta di usi collettivi già al tempo dei Giudicati indicando con il termine di "Monte", l'area interessata. Seneghe apparteneva al giudicato di Arborea, nel *Monte* stanziavano i cavalli e le mandrie del Giudice, e i Seneghesi potevano usufruire del diritto di pascolo, di legnatico e ghiandatico, oltre che di caccia. Questo diritto, così radicato nella cultura della popolazione di Seneghe, si è tramandato fino ai giorni nostri con un attaccamento al bosco, che si manifesta anche nella locuzione popolare "*su Monte est su nostru*".

## 2. Metodi

### 2.1. Inquadramento geografico del territorio di Seneghe

Il Comune di Seneghe si trova a mezza costa sulla falda meridionale del Montiferru, il più ampio complesso montano di origine vulcanica della Sardegna, situato nel settore centro-occidentale dell'isola. Dall'alto dei suoi 350 m s.l.m. il paese sovrasta la sottostante area del Campidano spaziando con la vista fino al Golfo di Oristano, ai monti Arci e Grighine ed a quelli più lontani ed elevati del Gennargentu. Il territorio, per la massima parte collinoso, nelle zone sottostanti il centro abitato e nel costone che lo sovrasta è utilizzato, più o meno estensivamente, come pascolo. Trovano una certa diffusione gli uliveti, ci sono pochi vigneti e qualche seminativo. La parte più elevata, che non supera gli 800 m di altitudine, è coperta da boschi ricchi di lecci e sughere.

La descrizione del territorio riportata nel "Dizionario geografico storico statistico commerciale degli stati di S. M. il Re di Sardegna" (Angius-Casalis, 1833), ad eccezione di alcuni specifici aspetti, è in gran parte ancora rilevabile nello stato attuale dei luoghi, ad indicare una conservazione nel tempo degli usi del territorio. Nel territorio montano sono presenti gli antichi ademprivili di Cadenneghe, Sos Paris, e Funtanas; a questi si aggiungeva quello di Biarzu, liquidato con la legge del 4 gennaio 1863 (Pili Deriu, 1993).

### 2.2. Ricerca d'archivio

L'indagine è stata sviluppata analizzando tutti gli archivi degli enti pubblici che è stato possibile individuare: Comune (1885-1996), Ispettorato di Oristano del CFVA (Corpo Forestale Vigilanza Ambientale, 1950-2000), Archivio di stato di Oristano e di Cagliari (Cadoni, 2004). L'analisi è stata integrata con le informazioni disponibili nelle pubblicazioni di studiosi e autori locali e regionali. Si è cercato quindi di raccogliere, da una parte, aspetti della tradizione socio-culturale del comune di Seneghe e dall'altra, di contestualizzare meglio gli usi locali rispetto alle normative vigenti nei diversi periodi storici dell'isola. Infine, la ricerca è stata arricchita dalle informazioni raccolte tramite interviste a testimoni privilegiati che hanno permesso, in alcuni casi, di sopperire a particolari lacune nei dati, in altri invece di ricostruire specifici usi, come ad esempio l'utilizzo del bosco per la produzione di carbone.

## 3. Risultati e discussione

La documentazione raccolta con le ricerche d'archivio, costituita prevalentemente da delibere del Comune, principalmente per problemi di conservazione, è risultata frammentaria, determinando discontinuità nella sequenza temporale degli eventi. I documenti presenti nell'Archivio del CFVA e nell'Archivio di Stato di Oristano hanno risentito delle modifiche degli assetti amministrativi del Comune di Seneghe. Negli uffici del Comune si è verificato invece un incendio che, all'inizio del novecento, ha causato la perdita di gran parte dei documenti. Il materiale raccolto è stato analizzato e classificato evidenziando riferimenti al legnatico, al pascolamento, alla produzione di carbone e al problema degli incendi.

### 3.1. L'uso civico di legnatico

I documenti ritrovati riguardanti il legnatico costituiscono il corpo più sostanzioso. Gli anni '50-'60 del secolo scorso segnano la modifica sostanziale delle consuetudini. La delibera più antica risale al 1909 e, fino al 1950, si ritrovano sporadici richiami diretti alla fruizione di uso civico di legnatico. Dopo, dalla fine degli anni '60 fino ai giorni nostri, l'utilizzazione del legnatico si registra con cadenza biennale.

I pochi riferimenti alla vendita di singole piante che si rinvengono nel primo periodo sono intesi a soddisfare bisogni contingenti della popolazione. La delibera del 02/07/1909, ad esempio, ha per oggetto il miglioramento delle condizioni del bosco tramite *sfoltimento*.

L'emanazione del primo regolamento di cui si ha testimonianza risale al 1912 ed esplicita il collegamento tra taglio del bosco e produzione del carbone. Il testo della relativa delibera afferma: "*…La pratica ha confermato quello che era opinione generale, che cioè i carbonai sono la vera rovina della montagna, poiché essi, servendosi dei permessi rilasciati agli aventi diritto, mentre fruivano quelli della porzione loro spettante, commettevano un vero vandalismo*". In seguito la pratica della carbonificazione è citata con accento diverso: è considerata necessaria per "*…far fronte alla penuria di carbone in tutta la regione*".

La carenza d'informazioni riguardanti questo periodo non è stata interpretata come indice di bassa incidenza dell'uso civico in bosco, essendo noti i citati problemi di conservazione dei documenti; inoltre, la pratica dell'uso civico non sempre dava luogo a registrazioni.

L'inversione di tendenza degli anni '50-'60 è contrassegnata dal cambiamento di fini e metodi delle utilizzazioni: declina la produzione di carbone effettuata da un numero limitato di ditte, e si diffonde il diritto d'uso esercitato da molti cittadini per l'approvvigionamento familiare di

legna da ardere. Contemporaneamente in quel periodo si registra il ricorso, nelle case, a nuove fonti energetiche quali il gas.

La consuetudine biennale di esercizio del diritto di legnatico, accessibile a tutti i residenti, è oggi consolidata. Il Comune richiede al Corpo forestale l'autorizzazione per il taglio di una porzione di bosco e predispone il regolamento che stabilisce modalità di fruizione, quantitativo spettante ad ogni nucleo familiare e quota dovuta. Questa ripetizione in forma quasi rituale ha creato, in un tempo relativamente breve, un momento di forte aggregazione socio-culturale con valenze identitarie.

La sequenza delle delibere di assegno del legnatico (8 documenti dal 1974 al 1994) documenta solo parzialmente i prelievi effettuati: mancano probabilmente due annate di legnatico, le fascine (legna con diametri inferiori ai 5 cm) non vengono registrate e nemmeno le asportazioni accessorie. La ricostruzione della distribuzione spaziale degli interventi a partire dal 1980 ha reso evidente l'aumento, di annata in annata, dell'estensione dell'area interessata dagli interventi (fig. 1). Il Corpo Forestale, sia in ossequio al dovere istituzionale, ma anche mosso dalla preoccupazione conseguente a questa tendenza di crescita, ha ripetutamente sollecitato l'amministrazione comunale a dotarsi dello strumento di pianificazione che la legge forestale prevede come obbligatorio per gli enti pubblici.

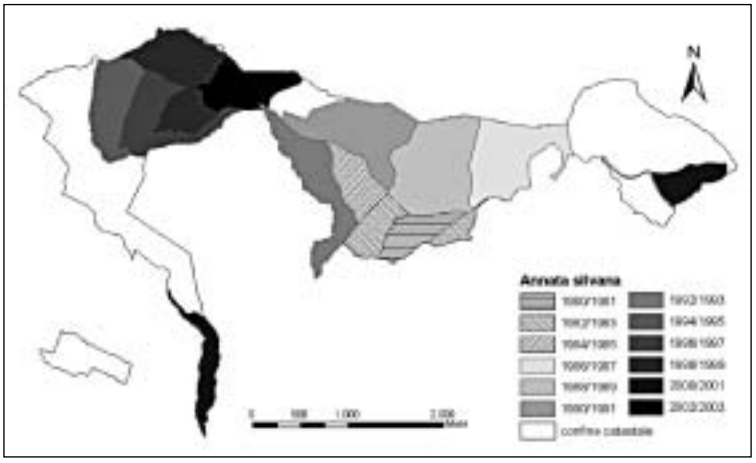



Figura 1.
Carta delle utilizzazioni

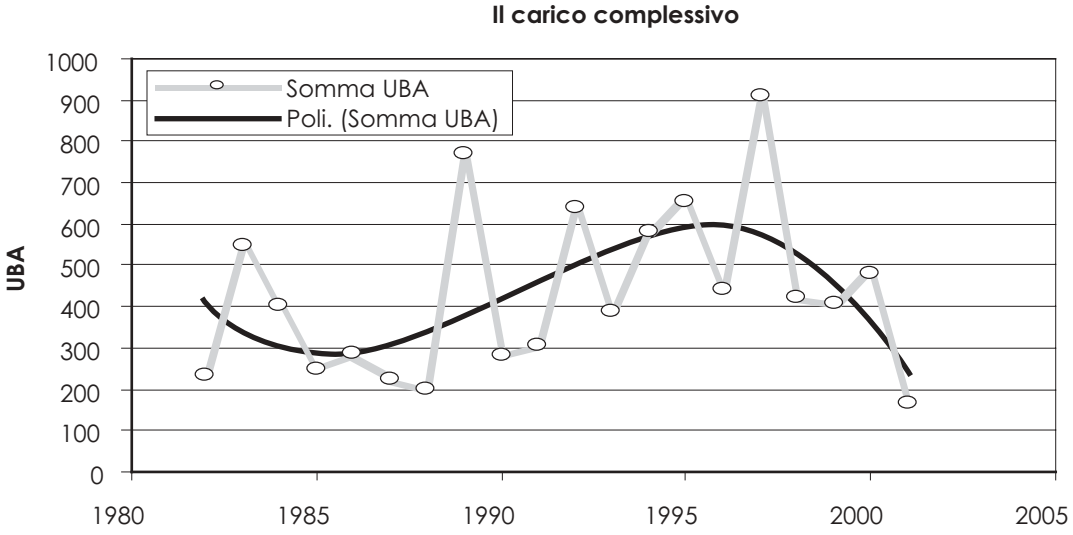
## 3.2. L'uso civico di erbatico e ghiandatico

L'uso civico del bosco per il pascolamento è documentato fin dal 1883, anno della prima delibera di capitolazione bestiame riscontrata. L'autorizzazione al pascolamento, nei terreni comunali non ancora affittati, è motivata dall'esigenza di "*distruggere tutta l'erba esistente nella foresta, prima della stagione estiva, onde impedire per quanto possibile, gli incendi quando queste diverranno secche*".

L'accesso del bestiame al bosco viene concesso per due brevi periodi uno estivo ed uno invernale, specificando in delibera: date di inizio e fine, località, specie consentite, prezzo da pagare per capo e, in alcuni casi, i carichi massimi ammessi, nonché i divieti relativi alle aree recentemente utilizzate. La quantità di documenti presenti in archivio con riferimenti all'uso civico di pascolamento è quindi notevolmente superiore rispetto al diritto di legnatico. Vista l'omogeneità e la costanza dei dati, le analisi sul pascolamento sono state effettuate considerando le registrazioni relative al periodo 1982-2003. Si osserva, oltre alla spiccata variabilità interannuale, una variazione di carico complessivo piuttosto accentuata. Si passa facilmente, da un anno all'altro, da meno di 300 UBA a più di 600 UBA tra ovini e bovini. Considerando indicativamente 0.5 UBA ad ettaro come soglia di carico prudenziale, i valori riscontrati a Seneghe (tab. 1) risultano orien-

tativamente entro il limite della sostenibilità nei livelli minimi, ma destano qualche perplessità nei livelli massimi. Si osserva una certa abilità degli allevatori nel rispettare le aree recentemente interessate dal legnatico.

Tabella 1. Rappresentazione grafico del carico




Un'indagine specifica (Salaris, Obinu, 2004) ha evidenziato e zonizzato cartograficamente, con riferimento agli ultimi anni, (fig. 2) i livelli di fruizione del bosco da parte dei pascolanti. Si osserva che le aree di concentrazione della fruizione sono piuttosto limitate, mentre risultano estese le aree classificate di espansione a frequentazione sporadica. Il pascolamento in bosco presenta, sotto il profilo economico, un interesse forse limitato; il suo rilievo dal punto di vista socio-culturale è probabilmente maggiore. Gli allevatori rappresentano una categoria ampiamente diffusa ed influente. L'esistenza, anche solo potenziale, del diritto di uso civico di pascolamento, molto più sommessamente rispetto al diritto di legnatico, rappresenta quindi un tema di elevata sensibilità sociale. Eppure, la perpetuazione a medio e lungo termine di questo uso è resa incerta dalle debolezze del quadro socio-economico e culturale del paese.

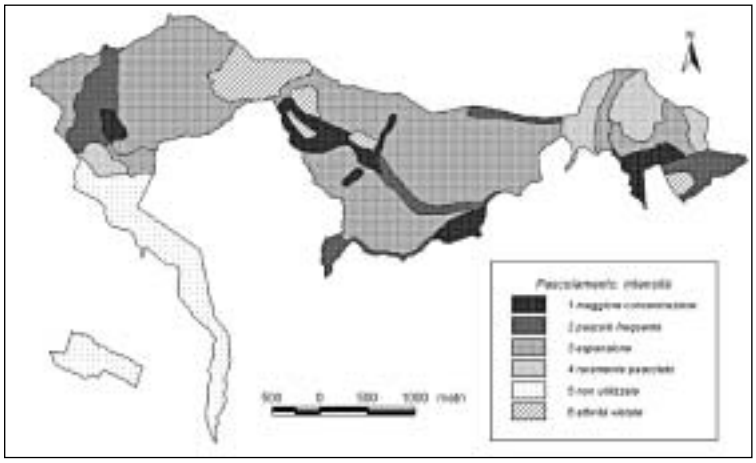


Figura 2.
Distribuzione dei livelli di fruizione per pascolamento

## 3.3. Produzione di carbone

L'analisi degli archivi ha fornito veramente pochi dati riguardo alla produzione di carbone rispetto alle attese conseguenti all'importanza storia di questa attività. Data la non netta distinzione con le richieste per la legna da ardere, una prima citazione relativa al carbone è inserita nel paragrafo sul legnatico. E' soprattutto in base alle testimonianze dirette e indirette, raccolte tramite interviste, che si ipotizza una importante produzione di carbone a Seneghe dagli anni '40 fino a fine degli anni '50. Le concessioni per la carbonificazione erano richieste da due o tre ditte che utilizzavano località diverse del territorio.

Le testimonianze raccolte presentano discordanze notevoli probabilmente conseguenti a condizioni del bosco molto diverse: in alcune parti la struttura era composta da alberi grandi, più o meno distanziati, e quindi con caratteristiche del sottobosco molto variabili; in altre zone erano presenti molte ceppaie ed alla struttura boschiva contribuivano significativamente i polloni. Di conseguenza si trova chi racconta della produzione di carbone a partire dall'abbattimento di singoli fusti enormi e chi descrive interventi assimilabili a ceduazioni con rilascio di 80-100 matricine ad ettaro.

Un indicatore espressivo dell'estensione e dell'intensità di questa produzione è dato dalla distribuzione e dalla caratterizzazione delle aie carbonili nel bosco. Attualmente è ancora evidente un numero elevatissimo di piazzole, in gran parte dotate di muro di contenimento. Anche nelle foto aeree del 1956 è evidente una rete capillare di aie di diverse dimensioni. Rimane arduo valutare i livelli di produzione annua complessiva e l'intervallo temporale a cui far riferimento. E' possibile, infatti, che la produzione di carbone fosse sostenuta già da metà del XIX secolo. Beccu (2000) riporta che "*…nella seconda metà del secolo scorso crebbe smisuratamente la produzione e l'esportazione del carbone vegetale, per il cui allestimento si ricorse alle piante d'alto fusto, più che alle boscaglie arbustive tradizionalmente utilizzate nel passato*".

## 3.4. Incendi

La documentazione trovata sugli incendi ci permette di ricostruire la ricorrenza del fenomeno nel territorio di Seneghe in un intervallo abbastanza ampio, che va dalla fine del XIX secolo fino ai giorni nostri. Il primo dato risale, infatti, al 1881 (Beccu, 2000), anno in cui si registrano ben tre incendi per cause ignote, per un'estensione complessiva di 65 ettari di territorio comunale.

Questa data del primo incendio non è casuale, né lo è la registrazione dei dati sugli incendi, ma è la conseguenza dell'emanazione della prima legge forestale dello stato unitario (R.D.L. n. 3917) del 1877. Con questa legge venivano sottoposti a vincolo tutti i terreni posti sopra la linea del castagno, e si rendeva obbligatoria, da parte dei Ripartimenti forestali, la registrazione di tutte le utilizzazioni boschive. Ci fu pertanto l'obbligo di tenere il "*registro delle superfici percorse da incendio*" in cui venivano registrati gli ettari, la località, la qualità di coltura e la proprietà dell'area percossa dall'incendio.

Il bosco di Seneghe, per effetto delle disposizioni del Regio Decreto, fu sottoposto a vincolo. Il ritrovamento, nell'archivio del CFVA, di questo registro ci ha permesso, insieme alle informazioni recuperate dagli altri archivi e da testimonianze dirette, di fornire un quadro abbastanza reale dell'incidenza del fenomeno sul territorio fino ai giorni nostri.

Dopo un lungo intervallo, che va dal 1881 alla meta del secolo scorso, in cui non si sono ritrovate alcune informazioni, segue la testimonianza, riportata su un supporto cartaceo, di un incendio del 1946 e poi, dal 1952 fino al 1993, i dati vengono registrati con regolarità. Per gli incendi più recenti è stato possibile individuare in cartografia l'estensione dell'area interessata.

Figura 3. Carta della distribuzione degli

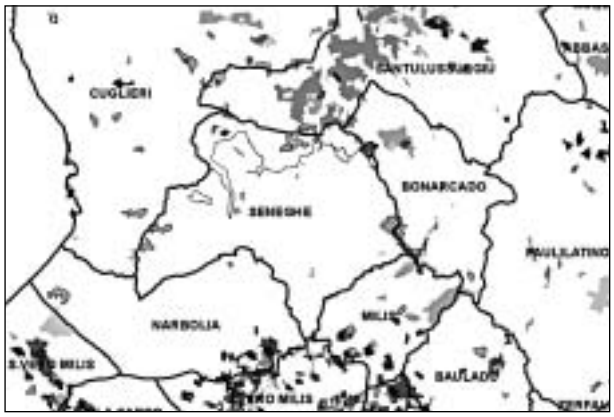



Figura 4. Mappa degli incendi 1995-2002

L'analisi dei dati testimonia senza dubbio, come evidenziato dalla carta della distribuzione degli incendi (fig. 3), la presenza ricorrente del problema, ma anche una certa capacità a circoscrivere gli eventi alle aree più esterne del confine del bosco. Seneghe è effettivamente orgogliosa di come ha tutelato il bosco, lo documentano i registri più datati, ma anche e sopratutto quelli degli ultimi decenni. Anche nella carta (fig. 4), prodotta da un progetto di ricerca europeo (Brundu et al., 2004) e che ricostruisce la sequenza degli incendi verificatisi nell'ultimo ventennio su questo versante del Montiferru, è possibile osservare una relativa minore intensità del fenomeno nel comune di Seneghe rispetto a tutti quelli limitrofi.

## 4. Conclusioni

L'analisi storico-bibliografica tesa a ricercare nel patrimonio culturale locale le fondamenta del quadro pianificatorio che il progetto si prefigge di costruire, ha messo in evidenza alcuni aspetti contrastanti.

In primo luogo la frammentarietà dell'insieme dei dati documentali è tale da non consentire, almeno per ora, un'interpretazione univoca o quantomeno non contraddittoria della storia forestale indagata, sufficiente a rispondere alla domanda "*da dove viene?*" il bosco che oggi vediamo.

Il raffronto tra la distribuzione delle "qualità di cultura" del Cessato Catasto valido fino al 1866 e quella del Nuovo Catasto Terreni (dal 1866 ad oggi) mettono in evidenza un aumento della superficie a bosco, da 953 a 996 ettari. Non si riesce a distinguere tra la ricolonizzazione conseguente alla cessazione del pascolamento, e la diffusione colturale delle specie arboree, realizzata grazie ad un'oculata gestione dell'attività zootecnica.

L'attaccamento della popolazione al suo territorio diviene elemento di sostenibilità nel caso come abbiamo visto dell'uso del bosco per il pascolamento, e nel caso della salvaguardia dagli incendi. Infatti, il pascolo in bosco, nonostante vi siano aree sovrapascolate, determina problemi sostanzialmente limitati, che possono essere risolti attraverso una gestione del pascolo più razionale.

La bassa frequenza degli incendi, rispetto ai comuni limitrofi e in generale rispetto ad altre zone della Sardegna, esprime un forte senso di proprietà e di affezione della popolazione nei confronti di *su Monte*.

Infine, nonostante le difficoltà evidenziate, appare comunque in tutta chiarezza che le conoscenze tradizionali riferite alla gestione selvicolturale si sono in parte dissolte e in parte distorte nella vulgata corrente. L'attuale consuetudine al taglio comunitario del bosco, non affonda le sue radici in una tradizionale attività selvicolturale, mirata all'ottenimento di certe provvigioni e al mantenimen-

to di certi standard ecologici, ma rappresenta piuttosto uno sfruttamento non razionalizzato di una risorsa delicata. Si constata infatti che nessuno, con capacità gestionale efficace, sa rispondere alla semplice ma ineludibile domanda: "In che modo si rigenererà il bosco che è stato ora utilizzato?".

Rimane in evidenza l'aspetto di forte aggregazione socio-culturale che la popolazione vive nel periodo del taglio del bosco e la pretesa di perpetuare il diritto a prelevare una risorsa limitata semplicemente perché tale diritto esiste. Manca la consapevolezza profonda della complessità di benefici che la risorsa "bosco" è in grado di fornire nel tempo se gestita in modo sostenibile.

## 5. Ringraziamenti

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Archivio del CFVA di Oristano

Archivio della Stazione Forestale di Seneghe

Archivio del Comune di Seneghe

# The conservation of cultural forest landscapes: the Vallombrosa Silvomuseum

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## Abstract

Silver fir has been cultivated in pure stands for many centuries in the Vallombrosa Forest (Florence, Italy). The silvicultural approach of the Vallombrosan Monks aimed both at the production of high quality timber and at the creation of a forest landscape which was well suited to the religious and spiritual vision of the Benedictine Order. These even aged, pure silver fir stands are still today a characterizing element of the Vallombrosa forest landscape. At the end of the XIXth century, with the birth and development of the Italian Forestry School at Vallombrosa, the silver fir stands became the scientific and didactic model of classic forest management based on the "normal" or "regulated" forest. In 1876 pure silver fir stands covered approx. 200 hectares around the Vallombrosa Abbey. In 1960 this surface had been extended to over 680 hectares. In the last decades forest management has undergone deep changes, following changes in social, economic and environmental conditions. Today silviculture and management are oriented towards the renaturalization of simplified forest systems. Thus the new Vallombrosa Forest Management Plan aims at the gradual evolution of the fir stands towards mixed stands with a more complex structure. To conserve the historic, cultural and landscape values of the silver fir stands a "Silvomuseum" has been created. The Silvomuseum includes 105 hectares around the Vallombrosa Abbey and represents the historic nucleus of the Vallombrosa Forest. A Forest Regulation Plan has been drawn out, following classic criteria and methods.

## 1. Introduction

Silver fir has been cultivated in pure stands for many centuries in the Vallombrosa Forest (Florence, Italy). The Vallombrosan Monks were the precursors of the silvicultural technique of clear felling and artificial stand regeneration, thus starting, in the XVIIth century, a management system that two centuries later had been widespread to much of Central Europe.

The silvicultural approach of the Vallombrosan Monks aimed at the production of high quality timber at the same time creating a type of forest landscape that was well suited to the religious and spiritual vision of the Benedictine Order. These even aged, pure silver fir stands have become a characterizing element of the Vallombrosa forest landscape and still today invite the visitor to meditation and a sense of sacredness.

With the birth and development of the Italian School of Forestry at Vallombrosa, the silver fir stands became the scientific and didactic model of classic forest management, based on the "normal" or "regulated" forest aimed at the maximization of annual yield. From the last quarter of the XIXth century the Vallombrosa Forest has been managed according to Forest regulation plans drawn up by the Chair of Forest Management of the University of Florence.

## 2. Forest management history of the Vallombrosa Forest

The first regulation plan was drawn out by Giacomelli in 1876. At that time silver fir stands covered approx. 200 hectares around the Vallombrosa Abbey. Clear felling and artificial regeneration was

prescribed; rotation age was 80 years. The plan was revised in 1886 and 1896 by Perona. In 1886 rotation age was extended to 90 years. Clear felling and artificial regeneration was maintained. In 1896 the surface covered by silver fir increased to 292 hectares (Table 1).

Table 1. Forest regulation plans for the Vallombrosa Forest silver fir stands

| Year | Author | Silver fir total surface | Silver fir clear felling | Rotation age | Forest regulation method |
|---|---|---|---|---|---|
| | | ha | ha | years | |
| 1876 | Giacomelli | 217,40 | 217,40 | 80 | age class area regulation |
| 1886 | Perona | 229,31 | 229,31 | 90 | age class area regulation |
| 1896 | Perona | 292,34 | 292,34 | 90 | age class area regulation |
| 1923 | Di Tella | 482,39 | 482,39 | 100 | age class area regulation |
| 1935 | Patrone | 493,45 | 493,45 | 100 | felling series |
| 1950 | Patrone | 517,56 | 517,56 | 100 | age class area regulation |
| 1960 | Patrone | 680,01 | 554,98 | 100 | age class area regulation |
| 1970 | Patrone | 664,45 | 445,02 | 100 | age class area regulation |

In 1906 the third revision was not carried out because in 1901 a State Law (n. 535) had prohibited clear felling in five State forests (Vallombrosa, Camaldoli and Boscolungo in Tuscany, Cansiglio in Veneto and Ficuzza in Sicily) because of their fundamental role in environmental protection and recreation (Baroni, 1992). During the first World war the Vallombrosa Forest was heavily exploited and most of the older fir stands were felled.

In 1923 a new Regulation plan was drawn out by Di Tella. At that time silver fir stands covered over 482 hectares. Rotation age was extended to 100 years and clear felling was again prescribed. In 1935 Patrone divided the forest in felling series and clear felling was organized in strips, each compartment being divided into 4 strips. This system soon proved too complicated and expensive and management returned to the traditional age class method.

The 1950, 1960 and 1970 plans all prescribed 100 years as rotation age, clear felling and artificial regeneration. In 1960 silver fir stands managed according to clear felling had reached a surface of 554 hectares. The 1970 plan prescribed a gradual conversion to mixed stands for approx. one third of the fir stands. This last Regulation plan has not been applied and only limited thinnings have been carried out in the younger fir stands.

In the last decades forest management has undergone deep changes, caused by changes in the social, economic and environmental conditions. Today, forest management must be based on the awareness that a forest, i.e. a complex biological system, cannot be transformed into a machine organized so as to produce high quantities of wood. Thus, silviculture and management are more and more oriented towards the renaturalization of simplified forest systems (Ciancio and Nocentini, 1996, 2002; Ciancio et al., 2003; Nocentini, 2000).

Coherently with this approach, the new Vallombrosa Forest Management Plan aims at the gradual evolution of the fir stands towards mixed stands with a more complex structure based on natural regeneration (Ciancio et al., 2006 in press). The new plan also takes into account the fact that the Vallombrosa Forest has been included in a NATURA 2000 Site.

This plan is thoroughly different from the proceeding ones and is based on the following criteria:

1. management must tend towards the increase of forest complexity and diversity instead of trying to maintain regular, homogeneous structures which were aimed at maximizing yield;

2. management must be based on a type of silviculture that is not tied to prefixed schemes but is instead free to follow the natural self-organizing processes of each stand; the general aim is to favour natural evolution towards mixed, self-regenerating stands;

3. monitoring and control are the basis for the evaluation of management.

This management approach will produce, in the long run, a change in the landscape characters of the Vallombrosa Forest, which has been produced by centuries of forest cultivation according to traditional techniques.

## 3. The Vallombrosa Silvomuseum

The idea of a "Silvomuseo" in Vallombrosa originates from the need to conserve the historic, cultural and landscape values of the silver fir stands. The aim of the Silvomuseum is to conserve a dynamic mosaic of pure, even aged silver fir stands by conserving the cultivation and management system started by the Vallombrosan Monks and later rationalized by the Italian Forestry School in accordance with "Scientific Forestry".

The "Silvomuseo" includes 70 silver fir compartments for a total of 105 hectares growing around the Abbey. These compartments represent the historic nucleus of the Forest. A Forest Regulation Plan has been drawn out, following classic criteria and methods.

Figure 1.
The Vallombrosa Abbey and the cultural landscape formed by pure, even aged Silver fir stands

The Silvomuseum is based on the same compartment division of the proceeding, historical Regulation plans. Compartment size is relatively small, usually under 3 hectares. Age of the Silver fir stands in the Silvomuseum range from 38 to 178 years. Silver fir is sometimes mixed with other conifers: austrian pine, spruce, douglas fir, larch. Sporadically broadleaves are also present under the fir trees, originating from natural or artificial regenration (chestnut, Turkey oak, beech, maples, ash, linden tree).

Silver fir stand structure varies with age and development phase. Younger stand are usually very dense and fir trees have shallow crowns. After 60 years of age stand density tends to be lower and some open spaces appear. Most of stands over 90 years of age show signs of underplanting with broadleaves carried out in the past. As stand age increases, broadleaves, either planted or naturally regenerated, tend to grow and develop. Usually young fir trees establish naturally under broadleaves. Stands over 120 years of age show a stratified structure, often with big fir trees in small groups. In these stands natural regeneration processes tend to be more evident and active.

## 4. The Silvomuseum Forest regulation plan

The forest compartments that are near the Abbey and along the road that connects Vallombrosa to Saltino are intensively used for recreational purposes. For this reason the Silvomuseum management plan keeps these compartments apart and limits interventions to those necessary for guarantying tree stability and visitor security. The Silvomuseum also includes compartment n. 579 where there is the "Holy beech tree" which supposedly offered shelter and shade to Saint Giovanni Gualberto, founder of the Vallombrosa Monk Order.

For all the other compartments (for a total of 59, covering 86 hectares) a forest regulation plan was drawn out according to the area regulation method. Traditional clear felling with artificial regeneration is prescribed although with some changes related to the present situation of the stands. The main changes concern rotation age and silvicultural treatment.

Figure 2.
The Silvomuseum compartments

### 4.1. Rotation age

The first Forest Regulation Plan for the Vallombrosa Forest, drawn out by Giacomelli in 1876, prescribed a rotation age of 80 years. Later the rotation was extended to 90 then 100 years. At this age mean annual increment culminates and this choice was coherent with the aim of maximizing wood production.

Rotation age for the Silvomuseo has been extended to 150 years. This choice is due to various factors. First of all the aim is not the maximization of wood production, but the conservation of a mosaic of stands of various ages with valuable aesthetic qualities. Furthermore, since 1970 no clear felling has been carried out in the Forest and thus today more than 45% of the stands are over 100 years old (Figure 3). With a rotation age of 150 years the *regulated forest* will have at least 1/3 of the surface covered by stands with ages over 100 years, with big trees which have a high

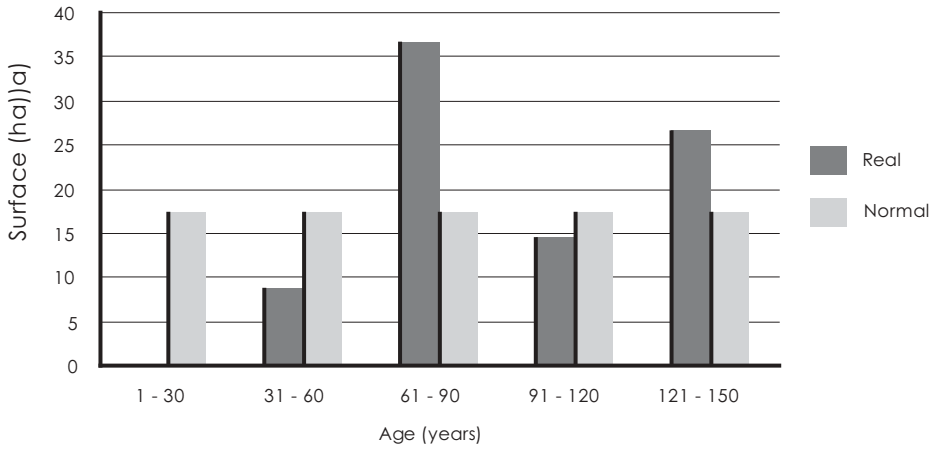


Figure 3. Real and normal area distribution in age classes

value not only from an aesthetic point of view but also for nature conservation. This aspect is particularly important for the role of the Vallombrosa Forest within NATURA 2000 Network.

The fully regulated forest will be reached, in theory, after a period equal to rotation age, i.e. 150 years. During this period clear cutting will be carried out only in stands over 120 years of age.

### 4.2. Silvicultural treatment

Because the aim of the Silvomuseum is to conserve the cultural forest landscape by conserving traditional silvicultural techniques, clear felling with artificial fir regeneration is prescribed. But, differently from previous Forest regulation plans, which prescribed total clear felling of each compartment, this plan prescribes that each clear fellings should not exceed 3000 square meters. This change has been introduced in accordance with the Italian Silvicultural School which prescribes relatively small clear cuts for silver fir in the Apennine environment to reduce the negative impact of this form of cultivation (Pavari, 1953).

Artificial fir regeneration will be carried out using young trees produced from local seed and grown in the local nursery. The inclusion of Silvomuseum fir stands in the Regional Seed Stand Register is very important in this sense.

### 4.3. Allowable cut control with volume regulation methods

The Silvomuseum Regulation plan, in accordance with the tenets of classic Forest management, also contains the control of the allowable cut with the traditional volume regulation methods. The aim is to conserve the historic documentation of the following methods:

1) Austrian formula

$$R_r = I_m + \frac{P_r - P_n}{T} = 609 \text{ m}^3 \text{ year}^{-1}$$

2) Masson method

$$R_r = P_r \frac{2}{T} = 679 \text{ m}^3 \text{ year}^{-1}$$

3) Hundeshagen method

$$R_r = I_m \frac{P_r}{P_n} = 530 \text{ m}^3 \text{ year}^{-1}$$

4) Di Tella method

$$R_r = \frac{2}{T}\sqrt{\frac{P_r}{P_n}}\,P_r = 571 \text{ m}^3 \text{ year}^{-1}$$

## 5. Conclusions

The Vallombrosa Forest landscape is the living evidence of the silvicultural practices carried out in the past. The last Forest management plan, drawn out in 1970, has not been applied and thus a slow change has started in the structural and aesthetic characters of the forest. Furthermore Forest management today tends to foster the renaturalization of simplified forest systems. Therefore there is now the problem of conserving what can truly be considered a cultural landscape.

The Silvomuseum Forest regulation plan is a fundamental part of this project. It must be followed closely and constantly if we want to conserve the structural and landscape characters of the Vallombrosa silver fir forest. The Vallombrosa Silvomuseum offers formidable opportunities also from the scientific and didactic point of view.

From the scientific point of view because its application will help in evaluating the sustainability of conserving cultural landscapes by conserving traditional silvicultural and management techniques. From the didactic point of view because forestry students will be able to analyse in the field the

practical and technical aspects of a Forest regulation plan drawn out according to classic Forest management. Furthermore it will be possible to compare this approach with the management of the rest of the Vallombrosa Forest, where a completely different and innovative approach is being experimented. The Silvomuseo thus plays a fundamental role in the conservation of natural and cultural values.

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# MCPFE commitments – political framework for social and cultural dimensions of SFM

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## Abstract

The Ministerial Conferences on the Protection of Forests in Europe (MCPFE) is a forum addressing common concerns and challenges of forests and forestry in Europe. The MCPFE commitments comprise promoting a balance between the economic, ecological and social and cultural dimensions of sustainable forest management (SFM).

The achievements of the MCPFE are regarded as milestones in the development of international forest policy ensuring that cultural and spiritual values are indispensable for the protection and sustainable management of forests in Europe. These political commitments have laid down general principles and provided important specifications for actions towards a common approach on preserving and enhancing forest cultural heritage throughout the region.

This paper provides an overview of the process of political recognition of social and cultural dimensions of SFM based on the achievements of the MCPFE.

## 1. Introduction

For over 15 years the Ministerial Conferences on the Protection of Forests in Europe (MCPFE) have provided a forum for cooperation towards common principles of forest management (SFM) throughout the continent. The dialogue within the MCPFE has succeeded in establishing close and fruitful cooperation on a wide range of concerns related to European forests and forestry, as well as in expanding political and scientific communication at an international level. Despite the fact that the actors involved represent various opinions and interests they share a common responsibility for the protection of forests and their sustainable development. Using as a basis voluntary commitments that constitute a common framework, governments all over Europe have taken initiatives to ensure and improve the protection and sustainable management of forests in the region.

Encompassing the whole of Europe, the MCPFE can be regarded as an example of cross-border cooperation stimulating mutual awareness and understanding of ecological, economic and socio-cultural dimensions of forests. The flexible and up-to-date approach towards building effective partnership between forests and society has been expressed through a number of MCPFE commitments that recognize the importance of the social and cultural values of forests as considerable elements of SFM. Consequently, the MCPFE definition for sustainable forestry (Helsinki, 1993) includes socio-cultural dimension along with the ecological and economic aspects.

The specific relationships between society and forests as well as a variety of marketed and non-marketed forest socio-cultural services, the acknowledgment of forest recreational and aesthetic values, the protection of areas with spiritual and cultural heritage, including the role of traditional forest-related knowledge, have been taken into account in the preparations of all Ministerial Conferences. This paper provides an overview of the process of political recognition of social and cultural dimensions of SFM through development of the political framework based on the achievements of the MCPFE.

## 2. Social and Cultural Dimensions in the MCPFE commitments

Since 1990 four Ministerial Conferences on the Protection of Forests in Europe have taken place addressing the priorities of forest policy at the pan-European level. These were identified through the 4 declarations and 17 resolutions signed in Strasbourg (1990), Helsinki (1993), Lisbon (1998), Vienna (2003) by the European ministers responsible for forests. These commitments are positioned within 3 pillars of SFM and comprise strengthening synergies and sharing common responsibilities for forests by promoting a balance between the economic, ecological and social and cultural dimensions of SFM.

The material and spiritual development of societies is tightly connected with forests. In many countries the cultural legacy of forests means tradition and the way of life, and these are connected with values, ethics, moral, rights, aesthetics, legitimacy, responsibility and religion. The significant role of the forest sector in sustainable development of society and the need to positively respond to increasing and sometimes conflicting demands of society resulted in the commitment made by the MCPFE Signatory States and the European Community recognizing that "*forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations*" (Resolution H1; MCPFE, 2000).

The fundamental role of cultural heritage provided by forests was acknowledged beforehand at the 1st MCPFE (Strasbourg, 1990), where the Signatory States affirmed that "*forests in Europe make up an ecological, cultural and economic heritage that is essential to our civilization*" (Resolution S1; MCPFE, 2000).

The 2nd Conference (Helsinki, 1993) responded to the global discussion on sustainable development by recognizing that "*forests in Europe grow in a widely varying environment, have a long history and have been influenced by human settlements and actions over centuries, leading inter alia, to knowledge that had contributed to the development and implementation of management regulations and policies*" (Resolution H1; MCPFE, 2000). As the result sustainable forest management was defined as: "*the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems'* (Resolution H1; MCPFE, 2000).

The General Guidelines for SFM, specified in the Helsinki Resolution 1 (H1), reflected on national tradition: "*Forest policies, as adopted to local laws within the framework of national traditions and constitutional processes, should recognize the long-term nature of forestry*" (Resolution H1; MCPFE, 2000). At the same time the conservation of landscapes and areas with cultural heritage regarding forest management practices was promoted in para 6 of this Resolution: "*Forest management practices should have due regard to the protection of areas of ecological fragility, to the conservation of primary and climax forests, areas with cultural heritage and the landscape*" (Resolution H1; MCPFE, 2000).

On the whole, the Helsinki Resolutions and the General Declaration constitute a joint response of the European countries to many of the forest decisions taken at the global level through the ministerial commitments to stimulate and to promote the implementation of the Rio Declaration, Agenda 21, the Statement of Forest Principles[1] as well as the Convention on Biological Diversity (CBD). These cover a whole range of issues on cultural and spiritual factors in international conventions, agreements and processes.

[1] United Nations Conference on Environment and Development, Rio de Janeiro, 1992

In the spirit of the above vision and in terms of sustainable development of society, the 3rd Conference (Lisbon, 1998) focused on the relationships and interactions between forest and society. In the Lisbon Resolution (L1) the ministers declared their commitment to "*enhance the social and economic elements of SFM and strengthen the links between the forest sector and society by increasing dialogue and mutual understanding*". It was stressed that "*marketed and non-marketed cultural social and environmental services of forest should be assessed and their contributions to society (…) should be integrated in overall policies and programmes of the forest and other sectors*" (Resolution L1; MCPFE, 2000). Further research efforts on the social economic aspects on SFM, and in particular on the assessment and valuation of forests goods and services, was strongly encouraged with the purpose of providing reliable background for policy decisions (Resolution L1; MCPFE, 2000).

While multiple roles of forests were broadly discussed in Lisbon with a considerable emphasis given to socio-economic aspects of SFM, the ministers taking part in the 4th MCPFE (Vienna Summit, 2003) committed to strengthening synergies for sustainable forest management in Europe through cross-sectoral cooperation and sharing the common responsibilities for sustainable management of forests by fully recognizing forest social and cultural dimensions in the separate resolution (V3). This Resolution specifies the means of preserving and enhancing the social and cultural dimensions of SFM by:

"▪ *encouraging the identification, expression and communication of the social and cultural dimensions of sustainable forest management inter alia by including them in education and rural development programmes*"

- *maintaining and further develop both the material (e.g. wood in architecture, medicinal plants) and the non-material (e.g. recreation, well-being, health) social and cultural aspects and benefits of sustainable forest management,*
- *maintaining and increase the attractiveness of the landscape by, inter alia, enhancing and preserving traditional elements of the cultural landscape; raise awareness of the contribution of traditional knowledge and practices in sustainable forest management for the protection of landscapes, the conservation of biological diversity as well as for protection against natural hazards,*
- *identifying, assessing and encouraging the conservation and management of significant historical and cultural objects and sites in forests and related to forests in collaboration with relevant institutions,*
- *encouraging multi-disciplinary research into the role of the social and cultural aspects of sustainable forest management in the overall goal of sustainable development, including the role of traditional forest-related knowledge production of goods and services from forests under sustainable management.*
- *engaging further research efforts on the socio-economic aspects of sustainable forest management, in particular on the assessment and valuation of the full range of forest goods and services, in order to provide reliable information for policy and decision making and public dialogue*" (Resolution V3, MCPFE, 2003b).

The commitments of the Vienna Summit aim at improving knowledge and understanding of all socio-cultural aspects of forestry, including traditional forest-related knowledge. Aiming to further promote and increase the general awareness of the cultural dimension of SFM, they give support to all decisions related to the social and cultural values made at a global level by taking into account the outcomes of the United Nations Forum on Forests (UNFF), the Intergovernmental Panel on Forests (IPF), the Intergovernmental Forum on Forests (IFF) and the CBD as well as by acknowledging the achievements of the UNESCO on preserving the cultural heritage.

Following the Vienna commitments (Vienna, 2003) the MCPFE Seminar "Forestry and our cultural heritage" was convened in Sunne (Sweden, 2005). The meeting was a first step for identifying chal-

lenges and threats to cultural heritage in forests. The outcome of this meeting recognized a need for further development of understanding of the cultural dimensions of SFM (MCPFE, 2006).

## 3. MCPFE Policy Tools

### 3.1. Pan-European Criteria and Indicators

To ease national application of the endorsed commitments, the MCPFE offers various instruments for the implementation SFM. By means of policy tools, such as the "Pan-European Criteria and Indicators (C&I)", the European countries are encouraged to monitor, assess and report on the state of European forests at a national level. The six Criteria represent the consensus achieved by European countries on the most important characteristics of sustainable forest management. The fulfilment of criteria is evaluated by means of indicators used for data collecting over a time period in order to make changes for each criterion more visible.

Specific references to national assessment of cultural values were provided by the C&I endorsed at the 3rd Conference (MCPFE, 2000) under the frame of Criterion 6: *Maintenance of other Socio-Economical Functions,* which included four descriptive indicators. Criterion 6 was developed to contribute into reaching a better understanding among countries regarding applied terms, definitions, methods concepts, approaches and concerns and provides for programmes to conserve culturally valuable sites and landscape as well as management guidelines which recognize cultural heritage with respect to forestry. Descriptive indicators included in Criterion 6 are connected with existence of a legal framework that recognizes cultural heritage in relation to forest and capacity of institutional framework including a financial instrument to conserve culturally valuable sites and landscape.

Complementary support to the identification, conservation and management of significant historical objects and sites in forests was given in the set of Improved Pan-European Indicators for SFM (MCPFE, 2003a) endorsed at the Vienna Summit, which included the additional indicator 6.11 addressing the number of sites within forest and other wooded land designated as having cultural or spiritual values. The rationale for this indicator emphasizes that: "*Forests have many cultural and spiritual values for societies and individuals, notably for religious, aesthetic and historical reasons. Although frequently intangible and/or personal often these values are manifested in particular sites which are increasingly being identified, listed and protected. The number of such sites officially designated is a rough indicator of the cultural and spiritual values assigned to its forests by society. Examples of such sites are archaeological sites in forests, giant or unusual trees, the sites of historical events or of special ceremonies or customs, particularly beautiful landscapes, sites linked to famous individuals etc. In many cases the sites concerned will be small in area, so the unit is number of sites rather than area of forest*" (MCPFE Document, 2003).

The Vienna commitments provided the background for the pan-European actions towards the implementation of Resolution 3 that were specified in the MCPFE Work Programme (MCPFE, 2005). The MCPFE Questionnaire on data availability on Indicator 6.11 was one of the follow up actions towards analysis and management of obtainable data on forest related cultural sites. The results of the survey showed many potential objects for Indicator 6.11 as well as various relevant sources of information on forest sites with cultural and spiritual values. At the same the collected data provided evidence on a necessity for common efforts so as to ensure the consistence and similarity of the parameters of sites and to secure most efficient ways of obtaining information. The results of the Questionnaire supported the process of elaboration of the MCPFE-UNECE/

FAO Enquiry – National Data Reporting Forms for Indicator 6.11, which will be included in the MCPFE 2007 Report on SFM.

## 3.2. Guidelines for Sustainable Forest Management

### 3.2.1. General Guidelines for the Sustainable Management of Forests in Europe (Resolution H1)

The best use of forest related experience and knowledge, consideration for all socio-economic functions, including recreational and aesthetic values of forests, are particularly significant for the achievement of sustainable forest management in Europe. This is ensured through the implementation of the General Guidelines set out in Resolution H1 (Resolution H1, MCPFE, 2000). Recommended forestry policies are adapted to local laws within the framework of national traditions an constitutional processes in order to maintain an appropriate level of continuity in legal, institutional and operational matters.

The Guidelines promote multiple-use forestry to achieve an appropriate balance of various needs of society and emphasize that forest management practices should have due regard to the protection of areas with cultural heritage and landscape. Legal, customary and traditional rights related to forests and protection of specific historical, cultural or spiritual significance are fully recognized and respected (Resolution H1, MCPFE, 2000).

### 3.2.2. Pan-European Operational Level Guidelines for Sustainable Forest Management (Resolution L2, Annex 2.)

The "Pan-European Operational Level Guidelines for Sustainable Forest Management" (Resolution L1, MCPFE, 2000) were endorsed as a framework of recommendations for SFM for practical use on a voluntary basis. These Guidelines follow the structure of the six pan-European criteria, identified as the core elements of sustainable forest management. This tool complements national and/or regional instruments to further promote SFM at the field level by translating the international commitments to the level of forest management planning and practices. They are divided into the 'Guidelines for Forest Management Planning' and the 'Guidelines for Forest Management Practices', and focus on basic ecological, economical and social requirements for sustainable forest management within each criterion.

### 3.2.3. Guidelines for Forest Management Planning

The Guidelines for Forest Management Planning consider the multiple functions of forests to society, regard to the role of forestry in rural development, and especially consider new opportunities for employment in connection with the socio-economic functions of forests.

Maintenance of socio-economic functions and conditions in the European forests is ensured by:

– adequate public access to forests for the purpose of recreation, taking into account the respect for ownership rights and the rights of others

– recognition of sites with specific historical, cultural or spiritual significance that should be protected or managed in a way that takes due regard of the significance of the site (Resolution L2, MCPFE, 2000).

### 3.2.4. Guidelines for Forest Management Practices

It is recommended that forest management practices should make the best use of local forest related experience and knowledge, such as that of communities, forest owners, NGOs and local people. Forest management operations should take into account all socio-economic functions, especially the recreational function and aesthetic values of forests by maintaining for example various forest structures and by encouraging attractive trees. This should be done, however, in a way and to an extent that does not lead to serious negative effects on forest resources, and forest land (Resolution L2, MCPFE, 2000).

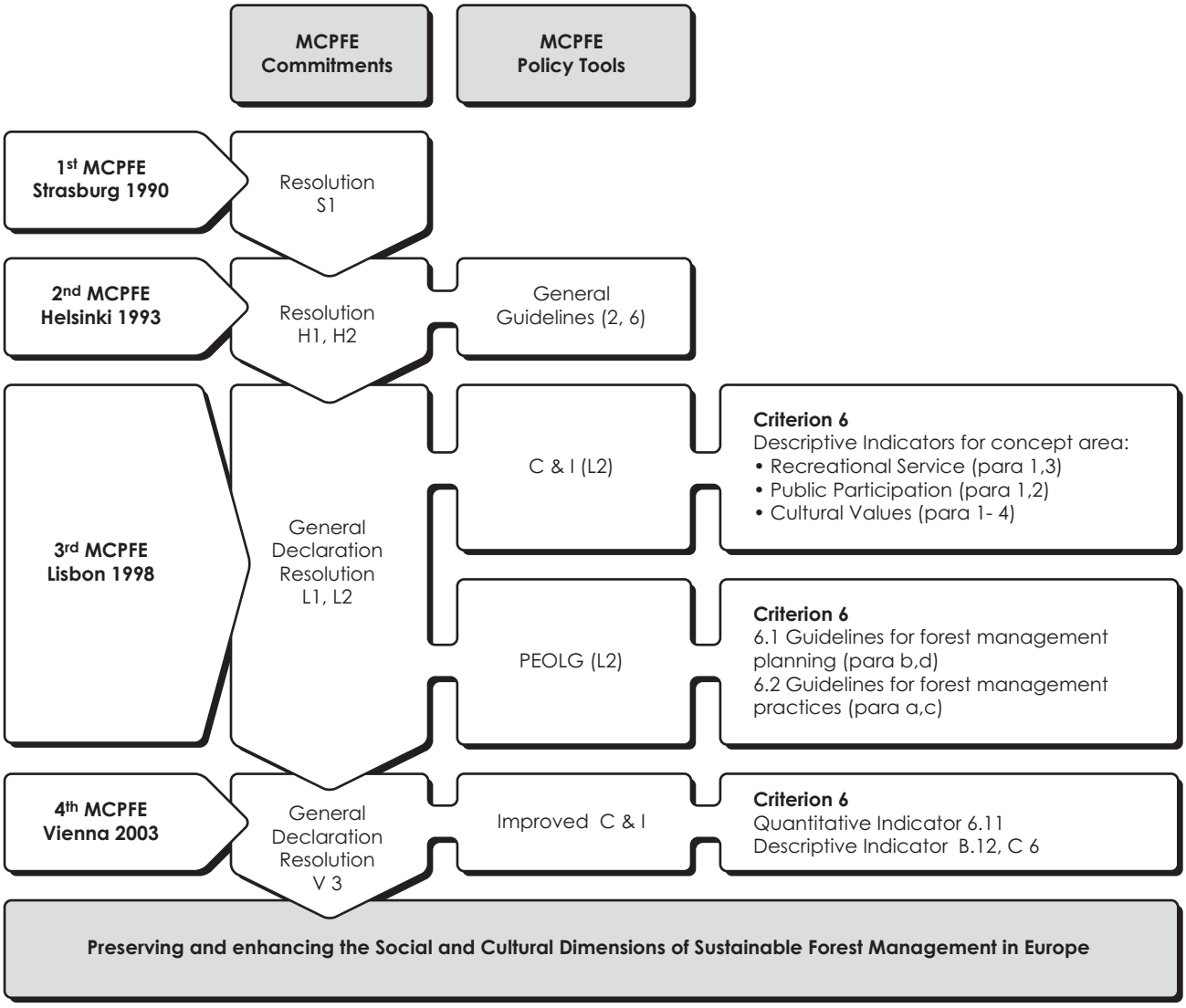


Figure 1. Political recognition of social and cultural dimensions of SFM by the MCPFE

## 4. Conclusion

Sustainability in forest management in Europe was formerly considered solely as the sustained yield of timber to preclude handle wood shortages. During the 1990's the concern about decline of forests led to the increasing awareness of the broader public of the economic, ecological and cultural values of forests. Their influence on human health and quality of life has been gradually integrated into forest management in a balanced way, reflecting both the development of all aspects of SFM within the overall socio-cultural framework and the maintenance and promotion of more permanent, traditional values.

The achievements of the MCPFE are regarded as milestones in building international forest policy by using a common framework to ensure that cultural and spiritual values are essential for the protection and sustainable management of forests in Europe. Underlining the importance of the cultural dimension of SFM for society, and understanding that cultural values change over time as societies develop, the European ministers at the Vienna Conference (2003) committed to actions that address cultural dimensions in national forest policies, include them in communication and education programmes and support collecting data on forest related cultural sites. The political commitments on the role of traditional knowledge and practices in SFM in the protection of landscapes and conservation of biological diversity were specifically expressed in the Vienna Resolution 3.

Currently, the socio-cultural aspects of forests are covered by national and/or regional laws and regulations and are being regularly monitored in European countries. The MCPFE commitments are used as important rationales for actions to be taken at a national level and thereby are making practical and valuable contributions to the protection of cultural heritage of European forests. The implementation of these commitments provides experiences and evidences for further political developments. On the other hand, however, even though the Ministerial Conferences have laid down general principles, the commitments need to be translated into more specific actions at all implementation levels. Further development of the pan-European recommendations on cultural and spiritual values of forests will build a common approach towards preserving and enhancing the social and cultural dimensions of SFM. These aspects can grow stronger and will be more respected only through heightened awareness and understanding based on improved knowledge.

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# "Forest + Culture" in Austria: basic principles, objectives and ongoing projects

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## Abstract

With forests making up about 47 % of the national territory and forest stands rich in supplies, Austria has the advantage of regionally differentiated and characteristic experience with sustainable forest management on the one hand, and with interesting interdependencies between the status of forests and the different socio-political, cultural developments on the other hand. By selectively integrating into all relevant policies *(Austrian Forest Dialog, National forest programme, the programme of rural development, etc.)*, public relations and awareness-raising campaigns for forests recognised works and future-oriented projects in visual and performing arts, a larger number of people can be educated about forestry, its historical and cultural background, rousing and increasing their interest in forests. In the Austrian national forest policy, the cultural aspects of sustainable forest management are being afforded – based on three major principles: Motivation, Planning and Training. The following article exemplifies them by three ongoing activities: the "Network Forest-Culture Austria", "Technical forestry plan – pilot projects" and (especially referring to item 6 of the Vienna Resolution 3) the "Advanced training course for Forest + Culture".

## 1. Introduction

If we speak about the development of cultural dimensions of sustainable forest management in Austria, a few conditions should be emphasised: Forests and woodlands cover almost half of Austria's federal territory (more then 47 %) Typical for Austria is also the domination of forests in mountain areas with their specific problems – because of their ecological an economical sensitiveness. The enormous importance is attached to the protective functions of forests. The domination of private ownership and small enterprises; we should point out the crucial role of farm – forestry owned by families, in providing and shaping landscapes and the large cultural heritage that is still intact. Our extraordinary large historical and cultural heritage with a strong coherence to the characteristic and beautiful landscapes, make up an essential foundation for the tourism and leisure industries, two sectors of vital importance – especially in the rural areas. And lust but not least: the specific legal situation: It shall be noticed, that the forest authorities are not direct responsible for a detailed or systematic documentation or preservation of relevant sites/Monuments etc. The forestry act does not provide this contents and the forest authorities don´t have personal or financial resources for this tasks. (It's the job of the "Austrian federal office for the care of monuments"[1] – based on the "Federal act for the protection of monuments"[2] .

The following picture may be useful; we developed it, to win an overview for the "Austrian forest dialogue" concerning cultural and social aspects: "Forest – Culture in Austria" consists of material and immaterial components, there exist economical, ecological and social values, the outside ring shows the most important possible partners, we should win and: develop the assets with them:

[1] in german: "Bundesdenkmalamt"
[2] Denkmalschutzgesetz; Federal law gazette Nr. 170/1999. (Keine engl. Fassung verfügbar.)

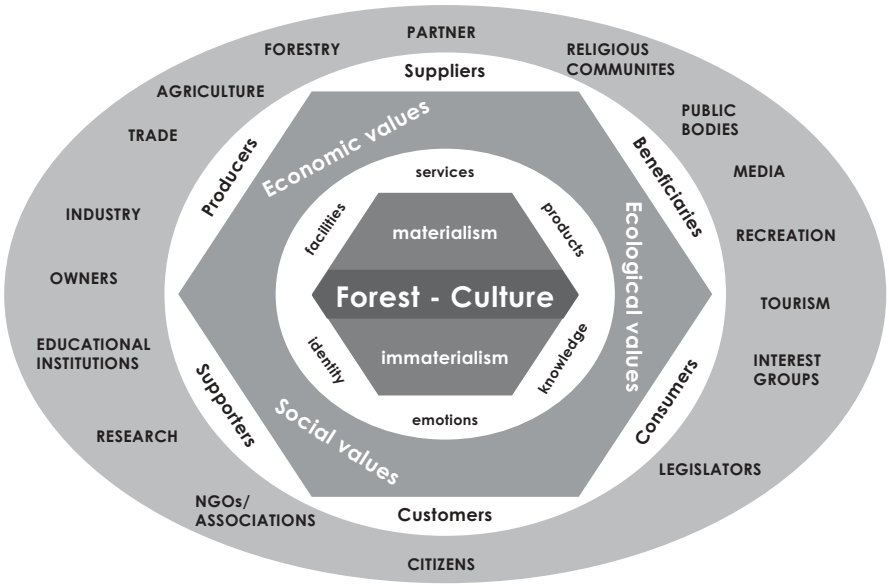


Figure 1.
Graph Forest-Culture in Austria
(Source: BMLFUW)

Two important European instruments may give us orientation and – last but not least – important inputs for financial support: The first one – more suitable for the strategical basics – is Vienna Res. 3: At item 6 of "Vienna Resolution 3" (for example), it was decided that: "… social and cultural dimensions of sustainable forest management should be included in education and rural development programmes …"

The second European Instrument, I want to highlight, is the programme of rural development: The "Rural development programme" as most comprehensive subsidisation programme for rural areas in Europe – offers financial support by a few articles, that may be interesting in our forest-cultural context: Diversification/Development of rural tourism/Training and information programmes will be subsidised from 2007 in Austria. For the development of forest-cultural contents, we have to take the chance. A central point for the involved Austrian Experts is: How to motivate forest – experts and their (potential) partners?

We decided:

- to bring them together;
- to point out the themes and potentials;
- to develop concrete projects;
- to look, how to get the money (see above);
- and (last but not least) to speak about Quality and Trends.

But: It was clear for us: Our resources are limited, we've to go step by step.

The following examples will show you three different instruments, we actually use therefore: Motivation, Planning and Training.

## 2. Motivation

For Motivation of interested Forest-manager and their potential partner we founded 2003 the so called "Network Forest-Culture Austria". This is a specific Experts-network for forest-cultural Workshops/Meetings – dealing with specific themes, lectures, exhibits, to change ideas, data and information. The "Network" is selecting specific promising projects, prepare strategies, establish permanent links between enterprises and authorities, supply corresponding proposals for user-based research and last but not least to get a better overview about the number of relevant objects, sites, etc.

## 3. Planning

The second step is Planning: For a more systematic planning of forest-cultural values by the manager or owner of a forest enterprise, we use a part of the Austrian forest land use planning: it's the "Technical forestry plan": The last four years, the federal ministry initiated more than 20 pilot – projects for specific themes – like "Forestry + Water/Tourism/Natura 2000" and so on … Three of this projects (You see them here on the map, with the names of the enterprise …) are dealing especially with the subject "Forestry + Culture":

One there from presents the subject for the first time in a more complex way by combining three big Upper – Styrian forest enterprises located in the area of the so-called "Styrian Eisenwurzen": It's a region with a highly interesting forest-history, the exploitation of copper and iron since 1700 before Christ. The main-objectives are:

- to carry out a basic survey of the situation,
- to evaluate the existing data and sites, and
- to sketch short-, medium– and long-term strategies for further development …

The following picture shows some plan – details of one relevant site: Showing a historical hammermill, still existing:

Figure 2. TFP Styrian Eisenwurzen (Source: Ertler/Puster/2004)

| Site: | Hagenbachgraben | Forestry directorate: | | **Foundation Prince Liechtenstein** | | Political district: Forest administration | Leoben Forest Kalwang |
|---|---|---|---|---|---|---|---|
| Site: | Geographical position | Concerned FDP – partial areas | | | | Short description | |
| Serial number | Cadastral community, Austrai map-sheet, coordinates – area map, right/hight size | Serial number | reference number | Guiding function | Era | Historical importance | Status quo |
| Map grid Foundation prince Liechtenstein 1 | Liesingau Austria map-sheet 131 Coordinates – area map 31 108945/5252575 | 181 | 111 | Economic function | **Modern times:** Firewood and charcoal wood economy 1499-1900 | **Mountain historical importance:** The hammer mill in the Hagenbachgraben was founded at the time of the heyday of Kalwang. The iron-processing enterprises stimulated the – until than rather scarcely cultivated – side-valleys of the Alps, as the wood they needed for their purpose was only found in these places. The hammer mill played a crucial role in the flourishing of Kalwang. | The hammer mill in the Hagenbachgraben ceased operation at the beginning of the 20th century and is now owned by the Foundation Prince Liechtenstein. The outward appearance of the main building still resembles the original appearance. |
| G5 | Landscape protection area 13, Rotenmanner-, Trieben-er-, and Seckauer Alps | | | | | | |


Figure 19: area map
Figure 20: Hagenbachgraben, hammer mill
Figure 21: Hagenbachgraben, piece of iron

Important outcomes of the projects:

- further Cooperation between the involved enterprises
- implementation of cultural aspects by the management
- restoration of selected sites and monuments
- to develop guided tours to selected sites or objects

Before we speak about the third example: "Training and Education", it should be emphasised, that our activities could be more dynamic, if we use the right subsidisation-instruments, related to the rural areas: If we take a look to programme of rural development, we see: It provides financial support not only for Cultural or tourism services in rural areas …

Or all forms of diversification – and especially: Training and education will be supported from 2007 in the EU.

## 4. Training

So, the Austrian MCPFE Experts said, okay: let us develop a specific "FOREST-CULTURAL TRAINING COURSE" – for forest-experts and their partner.

The last few months a small working group developed an Advanced Training course for Forestry + Culture in Austria.

Beginning in 2007, the course shall bring together 2 Target-groups:

- interested Forester and
- their Touristic/Cultural Partner.

The following graph gives an overview:

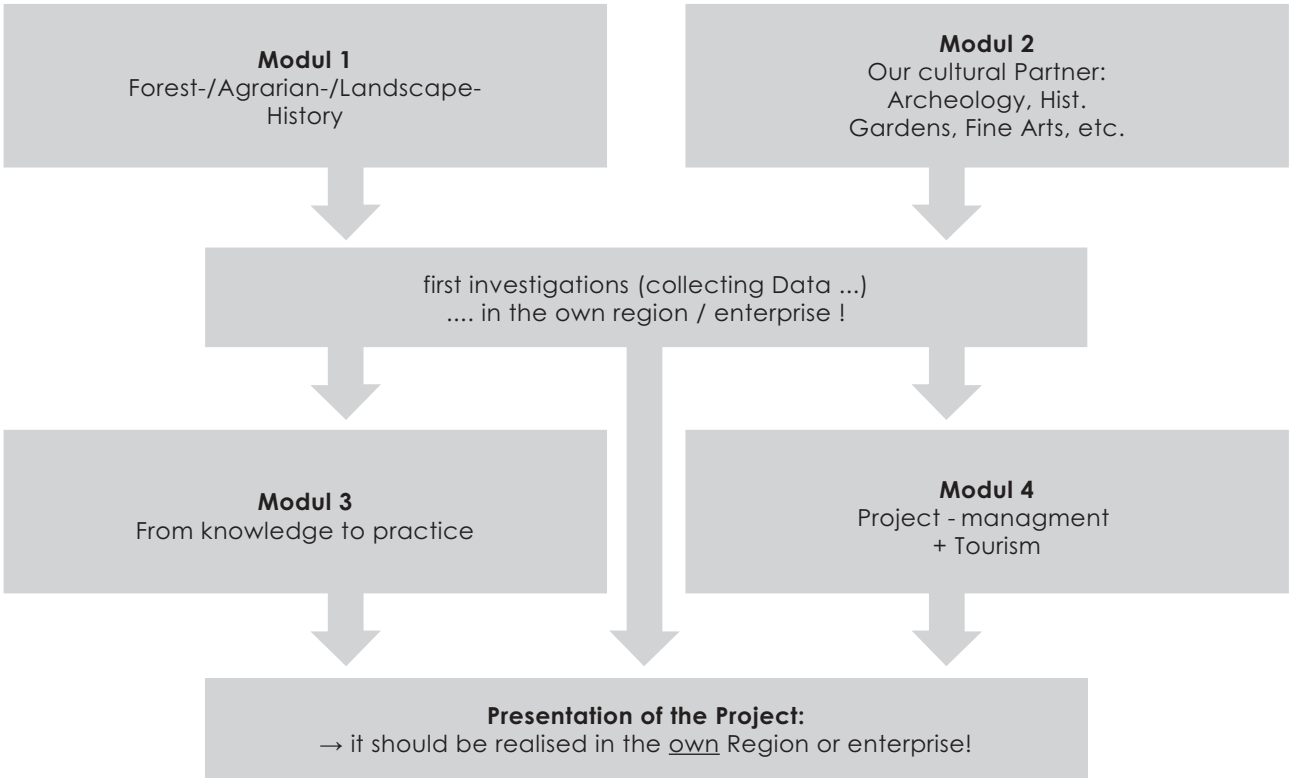


Figure 3. Graph Training Course Forest + Culture (Source: BMLFUW – Working group)

The first two modules, we want to realise 2007, Module 3 and 4 at the following year.

The main objectives are:

- to teach + present the basics + ongoing projects,
- to encourage forest experts for diversification by new projects in their enterprises/region,
- So we want to create stronger links between the partner in and outside of forest + cultural institutions,
- and last but not least: to ensure high Quality.

The course will be very project-oriented. Every participant has to study literature, collecting data, to work out and finally to present – and should if it's possible – realise a concrete project in his own region or enterprise.

In Module 1 forest – history take centre stage, Module 2 gives an forest-oriented insight to archaeology, the protection of monuments, historical Gardens and landscapes, Architecture, Woodlands in fine Arts and so on; every theme will be taught in theory and by practical examples in excursions: in museums, by ongoing projects, … at archaeological sites, historical gardens, fine Arts – objects and so on. So: Actually, we are very curious about the first module in spring 2007: How many colleagues will be interested on this subject???

## 5. Other ongoing projects and activities

Last but not least it may be useful, to give a short overview about a few other ongoing projects in Austria: We organise:

- a „LEADER +"work-shop for forest-Enterprises,
- consulting services for regional Exhibitions or projects,
- an international charcoal – conference etc.

In Austria, we are sure that the development of forest – cultural values could be an important contribution for future – oriented projects and partnerships in rural areas.

## Linking scientist with people – the role of the volunteer in British woodlands

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### Abstract

Whether it is the expert's need to harness local, traditional knowledge, or the government agenda of increasing access, the demand for much more participation by the public is everywhere apparent, enshrined in the European Landscape Convention, and much national legislation. Traditional conservation, whereby some special places and features were protected largely against the public, has given way to the public wishing to protect the entire landscape. Experts therefore struggle to take into account the totally different agenda of the local and the 'insider'. In Britain there is a particular habit of participation by the public via membership organisations such as the National Trust or the Woodland Trust, or by volunteering for work in the landscape, with organisations such as the British trust for Nature Conservation. A great number of people volunteer to work within the British landscape, including woodlands, planting, managing, interpreting, and repairing tracks. These volunteers are often a vital link with the local community; in some places the longer established village community derive their income by working for the great estate, whereas the wealthier newcomers earn their money elsewhere, but work voluntarily for the same estate. These volunteers, through their training or their membership of the local history society, frequently adopt the expert and academic points of view, but they also adapt the expert view to be more in line with public perception. They are a vital group bridging the gap.

## Hidden heritage in Dutch forests; management in practice

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### Abstract

The interest in the management of cultural heritage in the Dutch forests is rising rapidly. After recreation and biodiversity it seems to become the topic in the years to come. Cultural heritage could be an interesting carrier for forest management. The goals of cultural heritage can be easily mixed with the other forest functions, such as biodiversity, wood production and recreation. It can sometimes be awkward in forest management, but is can also be a valuable source of inspiration for both forest management and afforestation.

The first step in the sustainable management of cultural heritage is to know what you have. Several methods can be used for this, e.g. historical maps, aerial pictures, historic field names, archives, oral history and in The Netherlands also the so-called 'Actual Heightfile Netherlands'(AHN). The Dutch woodlands contain ten thousands of historical elements. It is impossible to preserve all these elements, because it would turn the Dutch forest into a sort of open air museum. It will be necessary to develop a decision tool for forest managers to decide which elements to protect and which not with criteria such as rarity, completeness, characteristicness, information value, replacibility, etc. On the basis of this decision tool or a sound decision by forest managers the most important elements will have to be preserved, restored, renovated or accentuated. In day-to-day management many practical questions will have to be answered and many tough decisions being made.

### 1. Introduction

The interest in the management of cultural heritage in the Dutch forests is rising rapidly. After recreation and biodiversity it seems to become the topic in the years to come. It is widely recognised that not only urban areas but also landscapes with a historical entity are highly appreciated by their habitants and visitors. Rural tourism is an increasing economic driving factor for the Netherlands. In 2005 Stichting Probos has published a book on the history and management of our cultural heritage in Dutch forests and has reported on this in Sunne, Sweden (see proceedings). It is widely seen as a good starting point, but more steps have to be taken to enlarge the knowledge to forest management in practice.

### 2. Cultural heritage as a carrier for forest management

Cultural heritage could be an interesting carrier for forest management. The goals of cultural heritage can be easily mixed with the other forest functions, such as biodiversity, wood production and recreation. Cultural heritage is on the opposite site of the spectrum of naturalness, but many historical elements are important features for biodiversity as they are gradients in the forest. Embankments for example are important features for rare plants, mosses and amphibians. Historical roads and paths have a high value for light and sun demanding species such as butterflies.

Wood production was a mayor driving force behind afforestation from 1750 to 1935. Most of the Dutch woodlands have been planted in this period as the forest area grew from 100.000 ha to

360.000 ha nowadays. Wood production is therefore an integral part of forest management focused on cultural heritage.

People love to walk and bike in areas rich in historical heritage and discover their roots this way. This is probably also the main reason for the sharp incline in interest in cultural heritage. It might be some sort of reaction to globalisation. The tourism industry starts to acknowledge the value of historical landscapes, including forest, by promoting tourism based on cultural heritage.

Figure 1.
Mechanised harvesting of coppice woodlands to reduce costs

### 3. Cultural heritage as a source of inspiration

Cultural heritage can sometimes be awkward in forest management. For example, when trying to restore the natural hydrological situation historical elements can be destroyed. A tough decison is necessary in these situations and a thorough consideration of all different values is necessary (interest assessment). However, in practise we see the destruction of many historical features without this proper consideration or even without the knowledge of the values or the existence of these features.

In many cases cultural heritage can also be a source of inspiration for both forest management and afforestation. Every year about 1.500 to 2.500 ha of new forests are planted every year in The Netherlands. Cultural heritage only plays a limited role in the design process. Historical roads and path are for example planted and new paths established. Why not use the old paths and roads? And why not try to incorporate old loam pits into the design?

There are two ways to use cultural heritage as a source of inspiration for designing a new forest. First, it is possible to maintain the specific features of the agricultural land where the forest is being planted, e.g. the shape of the agricultural lots. Second, it as also possible to extend the typical features of nearby forest into the new forest, thereby maintaining the typical local or regional character of the forest. Not only the visible historical features can be used as a source of inspiration. Also the historical management, legends and folk tales and oral history can be used in the management today.

Figure 2.
Restoration of loam layer to keep the 'spreng' (manmade water channel) waterproof

## 4. Know what you have!

The first step in the sustainable management of cultural heritage is to know what you have. Only few woodlands in The Netherlands have been thoroughly inventoried on historical elements. The few that have have shown an amazing number of elements, many of whom were not known before the inventory. Several methods were used in the inventories. Historical maps, aerial pictures and historic field names were studied, archives visited for relevant material, local people interviewed for their knowledge on more recent history (oral history) and the so-called 'Actual Heightfile Netherlands'(AHN) were investigated. The AHN-file reveals height differences of up to 10 cm in the field. Especially the AHN-file led to the discovery of many 'new' elements, such as Celtic fields and historical embankments.

After the first inventory it is not always clear what the elements are. What was it used for? How old is it? How was it managed? Again, relevant material from archives can used for the analyses and oral history for the more recent elements.

## 5. What to protect?

The Dutch woodlands contain ten thousands of historical elements. It is impossible to preserve all these elements, because it would turn the Dutch forest into a sort of open air museum. However, there is no tool available to forest managers who tells them what to protect and what not. Such a tool is available for historical buildings and the first steps have been taken to develop such a tool for historical forest elements as well. It is obvious that criteria such as rarity, completeness, characteristicness, information value, replacibility, visibility and the consequences for other forest functions will be part of this decision tool for forest managers.

Figure 3.
Removing vegetation of manmade pool

Figure 4.
Removal of wildshoots to improve the visibility of this 11th century fortress wall

## 6. Management strategies

Four management strategies are available for historical features. With historical elements active management is nearly always necessary to preserve the current situation (preservation). Without active management many historical elements will be lost in time. With the upcoming of tourism based on cultural heritage, the visibility of our past is becoming more and more important. The second management strategy is therefore focusing on accentuation of the elements (picture 4). Restoration is possible if the element is still physically there. We call it reconstruction when there are no traces left of the elements other than the word it has been there.

## 7. Management in practice

Many forests are the outcome of the work of many generations. Every generation has left its traces and can still be seen in the forest today. This sometimes requires tough decisions. For example, a former boundary between agricultural land and woodlands consisted of an embankment with oak coppice planted on top (picture 5). The embankment can still be seen, but the original slope has been heavily eroded and most oaks have been outcompeted by the beeches that have been planted afterward. There are many management questions. For example, is it worthwhile to spend the money on restoring the original slope of the embankment and ditch? And does it have to be accompanied with the replanting of oak coppice on top of the embankment? As a light demanding species this would require the removal of many beech trees. To show the original function of the embankment it would be worthwhile to remove some of the forest on the former agricultural land. Just how far do you want to go in restoring the original landscape?

In the same forest area another interesting management question arises. Prehistoric burial mounds are seen as important historical features. The standard advice is to remove any vegetation from trees or shrubs from these mounds, because they could damage them. But what do you do when you have 122 burial mounds in your small forest area?

Figure 5. Speulderbos, The Netherlands

Figure 6. Restoration of part of 15th or 16th century forest embankment (total length 12 km)

## 8. The future

The interest in cultural heritage in The Netherlands is booming. It probably won't keep this position for very long, but for now we have to take advantage of it by doing the right thing. First, to avoid the destruction of historical elements unknowingly, many forest areas are inventoried for historical elements. Hopefully we will have a decision tool ready in the near future for forest managers to decide which elements to protect and which not. On the basis of this decision tool or a sound decision by forest managers the most important elements will have to be preserved, restored, renovated or accentuated on the basis of a thorough analyses.

However, the management of cultural heritage is expensive. It is therefore necessary to give it an economic basis. Cultural tourism is seen as a possible source of income, when forest owners and the recreation sector join hands. Some initiatives have already shown that it is certainly possible to stimulate cultural tourism to support local economies.

# Cultural re-animation and rural development forestry: examples of a Leader + cooperation project between rural communities in Italy and Scotland

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## Abstract

In this paper we outline the experiences of a trans-national cooperation project called "Utilizing Woodlands" between project areas in GardaValsabbia (Italy) and the West Highlands (Scotland). Recording and re-animating the vestiges of a traditional woodland culture in each area is a key theme of a project that places strong emphasis on biodiversity conservation and sustainable forest management as key opportunities for rural development. Some of the results of these initiatives are presented in this paper, along with a discussion of some of the challenges and questions arising from our experiences.

## 1. Introduction

In 2004 a cooperation project called "Utilizing Woodlands" was initiated via the EU Leader+ programme between Local Action Groups in North Italy (LAG GardaValsabbia) and the West Highlands in Scotland (LAG Whelk). The project has been delivered primarily through two main partnership bodies with a strong rural development forestry remit: the Consorzio Forestale della Valvestino (CFV) and the Sunart Oakwoods Initiative (SOI).

Both areas share a number of challenges in terms of relative remoteness from urban centres, steep and difficult terrain which is considered 'unproductive' in terms of conventional forestry and agriculture, and a progressive reduction in population over recent decades. Both areas also have a relative abundance of natural woodland and contain significant areas of ecological habitats of European importance (part of the Natura 2000 network). Both areas also have their own distinctive local cultures and languages/dialects, and display a long history of silvicultural management and use of local timber, which is still kept alive (to varying degrees) by a handful of small farmers, craftspeople and woodworkers. In each area work is underway to rekindle the woodland culture, to restore the physical landscape, and to develop a healthy rural economy adapted to the sustainability challenges of the twenty first century.

## 2. Case study: The Sunart Oakwoods Initiative

### 2.1. Project scope and location

The Sunart Oakwoods Initiative (SOI) covers the peninsulas of Morvern and Ardnamurchan in a relatively remote area of the west coast of Scotland. The Initiative started in 1996 and has developed into an active partnership between local communities and local agencies (including Forestry Commission Scotland, Scottish Natural Heritage, Highland Council, and Lochaber En-

terprise). From the beginnings of the project, a key aim has been to maximise the contribution that sustainable management of local woodlands can make to the local economy, by helping to provide jobs directly through forestry and environmental management, and through the enhancement of tourism facilities and the interpretation of natural and cultural heritage. In effect, the Sunart Oakwoods Initiative is trying to create a new model of forestry for Scotland – rekindling a woodland culture, restoring landscapes and ecosystems, and helping to develop a healthy rural economy adapted to the serious sustainability challenges of the twenty-first century.

## 2.2. Woodland history and traditions of woodland management

The history of woodland cover in the Scottish Highlands has a relatively recent origin (in European terms) beginning with recolonisation of the entire land surface at the end of the last glaciation around 10 000 years ago, with woodland cover reaching a maximum around 4000 years ago. Throughout most of the Highlands the majority of original native woodland cover was lost in pre-historic times, with fragments surviving only in relatively discrete patches and localities, as depicted on maps of the Sunart area produced in the 18$^{th}$ and 19$^{th}$ centuries. These fragments of ancient semi-natural woodland have tended to survive in areas where they were either:

(a) physically protected from the effects of fire and grazing animals (e.g. in refugia such as steep-sided gorge and cliffs) or

(b) providing valuable resources of timber, fuelwood and wood-pasture for nearby settlements and/or hunting forests for the nobility.

In Sunart the pattern of woodland management appears to have gone through five main phases over the past 300 years (Peterken, G.R. and Worrel, R 2005). Prior to 1750 the traditional uses of woodland were mainly as wood-pasture (mainly for cattle and goats) and coppice woodland – particularly Alder *(Alnus glutinosa)*, Oak (*Quercus* spp.) and Hazel (*Corylus avellana*), with only a limited amount of felling in 'high-forest' being recorded.

Between 1750 and 1850 there was increased planting of Oak, as well as development of 'policy woodlands' (i.e. designed woodlands associated with large estate houses) using exotic tree species; wood-pasture and alder coppice continued to be important, and the management of oak-coppice for tanbark and charcoal became a significant and economically important activity. During this period the traditional social structures of the highlands were severely eroded, and with these changes came the collapse of the traditional subsistence farming system and its replacement by a cash economy and the crofting system. One further consequence of this upheaval was a gradual decline in the management of alder coppice and wood-pasture systems leading to a failure of these woodlands to regenerate.

Between 1850 and 1940 the active management of coppice and wood-pasture systems was more or less abandoned in favour of extensive sheep pasture. Policy woodlands continued to mature and localised patches of Birch regeneration occurred where grazing pressure was temporarily lowered.

The period from 1940 until the 1980's saw a rapid increase in afforestation with large areas of fast-growing exotic conifer species planted both on open ground and within existing semi-natural woodlands, mainly under the direction of the state forestry service (the Forestry Commission). Fluctuations in sheep numbers also allowed substantial regeneration of native species in some areas.

Since the 1980's there has been only limited planting of conifers and the harvesting phase has begun. This has provided opportunities for the restoration of the remnants of native woodlands

which were underplanted with conifers, and this has been accompanied by several substantial native woodland planting schemes (mainly on private ground). Ongoing grazing by sheep, red deer and some cattle has continued throughout most of the unfenced native woodland remnants.

Following from these 5 phases, the Sunart Oakwoods Initiative is taking woodland management into a new phase that aims to recreate extensive native woodlands for biodiversity and for local use, and to ensure that the policy woods and commercial softwood plantations also make a significant contribution to local rural development.

## 2.3. Restoring the physical woodland resource

A scientific and industrial paradigm dominated Scottish forestry policy and activity throughout much of the twentieth century. This approach has had a dramatic impact upon large areas of Scotland's current landscape (particularly in the uplands) and has resulted in production figures of around 6 million cubic metres of timber per annum mainly from plantations of exotic conifer species planted since 1945. In the Highlands of northwest Scotland the native woodland resource, already neglected and diminished due to a variety of factors (see above) was to a large extent replaced with the 'new trees'. The condition of the majority of native woodlands that survived did not improve until a change in the paradigm started to take shape at the end of the 20$^{th}$ century. This change is partly a result of improved understanding of ecological processes and partly a re-assertion of local communities' connection with their woodlands and heritage.

Since 1996 the major achievements in terms of restoration of the native woodland resource include the removal of 240 hectares of commercial softwoods (from PAWS sites?), the eradication of 45 hectares of the invasive shrub *Rhododendron ponticum*, the enclosure of 52 hectares of ancient SAC Oak woodland and the erection of a further 24 km of deer fencing to facilitate woodland regeneration, and the planting of 18 500 local provenance native tree seedlings. This has been accompanied by a range of scientific studies and monitoring activities, including studies on lower plants and butterflies and a range of surveys, fixed point photos and aerial photos. This period has seen the start of a major landscape-scale restoration programme and a major shift in the dominant paradigm of scientific forestry, with increased government support for restoration ecology, alternatives to clear fell and participatory planning

## 2.4. Re-connecting people with woodlands

From the beginnings of the project in 1996, a key aim of the Sunart Oakwoods Initiative has been to maximise the contribution that sustainable management of local woodlands can make to the local economy, and at the same time to increase the involvement and contribution of local communities in delivering that sustainable management through partnership working. In an economically fragile area, the opportunity to provide work both through forestry operations and enhanced tourism facilities has been maximised. All forest management has the potential to support rural development, but in Sunart the importance of the oakwoods in terms of European biodiversity places particular demands but also offers unique opportunities in this respect.

Local skills are needed to support this management, and this has led to the establishment of a sequence of local training initiatives in the area since 1998. The establishment of the ongoing Sgilean Na Coille ('woodland skills') project led from the experience and community involvement developed through two previous skills programmes, which identified ongoing training needs, and a variety of opportunites to increase the value of the woodland resources of the SOI area. The aim of the project has been to positively impact on the Ardnamurchan and Morvern economy

by maximising the benefits of the local woodlands, and the capability of the local population to sustainably and innovatively utilise this valuable woodland resource.

These objectives are being achieved by provision of a range of locally-run skills workshops, demonstrations and awareness-raising events focusing on the following themes:
- Woodland management and utilisation (particularly woodfuel and construction timber)
- Non Timber Forest Products
- Health and fitness
- Woodlands, biodiversity and sustainable tourism
- Woodland restoration techniques

The project is match-funded via a £140,000 package from WHELK LEADER+ , Lochaber Enterprise, Scottish Natural Heritage and Communities Scotland. Project and financial management support is provided by Lochaber College, with overall guidance and supervision provided by line managers from SNH and Lochaber Enterprise as well as the Sgilean na Coille steering group (consisting of members of the local community and representatives from local agencies and funding partners).

Since November 2004, Sgilean Na Coille has provided:

- 31 Training Courses
- 7 evening Talks
- 4 conference support / 'go see visits'
- financial support for 2 wood-working/furniture-making training courses
- 5 School placements
- 4 exchange visits between community members in Sunart and Garda ValSabbia, Italy.

There have been approximately 230 participants in the events provided to date. A programme of further events, including a joint final event with Garda ValSabbia is being finalised before the end of the project in October 2006.

This process of partnership working has identified an ongoing need to support land based skills development in order to achieve the aims of the wider SOI Action Plan and take forward specific community projects and aspirations. There has also been a general consensus that to maximise the value of the training provided efforts must be made to support local people to become trainers in the land-based skills they have developed. The trans-national project has also facilitated some very productive exchanges of interdisciplinary experience among craftspeople, artists, musicians, environmental educational specialists, forestry contractors and technicians, and has helped to stimulate an integration between traditional crafts and new product development.

Increasingly amongst the resultant skilled local workforce, the emphasis is shifting from simply providing labour, to using timber to support other business activities recognising that in a remote area with high transport costs, the best economic opportunities lie in using and adding value to timber locally. Current use of local timber includes woodfuel, boatbuilding, fencing, house construction and craft work.

Furthermore in an area of remarkable natural beauty, distinguished by a wealth of marine and terrestrial wildlife and biodiversity, tourism has long been an important sector of the local economy. Through improvements to woodland access and amenity and the development of new facilities, the Sunart Oakwoods Initiative is increasingly supporting the development of a local 'green' tourist industry.

The main achievements to date, in terms of eco-tourism and interpretation, include the construction of 10km of new footpaths (including provision for 'all abilities' access), the creation or upgrading of nine car parks to improve woodland access for visitors, the construction of the Garbh Eilean all-abilities wildlife hide, the establishment of four small tree-nurseries at local primary schools, the installation of a range of bi-lingual interpretation boards (in English with Gaelic 'echoes'), and the creation of a Gaelic alphabet trail and outdoor teaching facility (the Sgoil na Coille). Other outputs include the production of an environmental education resource pack for children, the production of a guide to cycling and mountain biking routes in the area and the creation and maintenance of the well-used SOI website.

## 3. Case Study: Valvestino, Garda ValSabbia

### 3.1. Project scope and location

During recent decades, the Lombardy Region (North West Italy) has promoted and supported the creation of forestry consortiums based upon partnership between public and private woodlands owners. These forestry consortiums are legally recognised bodies and they play an active role in the management of publicly owned woodlands. In this context, in December 2000, the Consorzio Forestale della Valvestino (CFV) was set up as an association between private woodland owners, local agencies and woodland sector entrepreneurs, in order to develop solutions to local woodland management needs in one of the most socio-economically challenged areas of the region.

### 3.2. Woodland history and traditions of woodland management

"*I lontani pendii delle montagne fumavano preparando carbone, e nello squallore delle valli disboscate era un andare e venire di gente nera e di mule cariche per i pesanti trasporti*[1]" This is the image that A. Cozzaglio (1914) give us about the upper Garda mountain landscape during the period of the Republic of Venice (in the 15$^{th}$ century).

At that time the woodlands were intensely managed to produce fuel for iron production in the local factories. At the beginning of the 20$^{th}$ century the production of iron collapsed and the intensive use of the woodlands to produce charcoal start progressively to decrease.

Another peculiarity of the woodland history of the upper Garda and Valle Sabbia are the laws concerning the common use of the natural resources (wood, grass, leaves, etc.). In the 18$^{th}$ century the privatisation of the common rights to use forests was going on all over Europe. In the year 1824 the Austrian government forced the mountain municipalities to sell their woodlands considering that only a private property could guarantee a rational use of the resources(A. Bianchi, G. Segala, 1913). The resistance of the local communities to the alienation of their right to use the woodlands was therefore considerable for all the 19$^{th}$ century.

At the beginning of the 20$^{th}$ century some of the local forests were confiscated by the Italian State since the local communities didn't pay their taxes. During this period the mountains were intensely used so that at the beginning of 1900 a local association called '*pro montibus*' was founded. The aim of this group of people was to support a cooperative approach to rural development based on the reforestation of the mountains.

[1] "The distant mountain slopes were clad in smoke from charcoal manufacture, and down in the squalor of the deforested valleys blackened people were going back and forth along with mules weighed down with heavy loads"

During the fascist era the plantation of new forests, mainly coniferous, was carried out on a large scale, especially in the Northern part of the coast of Lake Garda. The only place that in the different centuries was able to produce either charcoal or commercial timber was Valvestino. At the end of the 19th century Valvestino was producing around 250 tons per year (ERSAF, 1996). After the second World War the use of woodland drastically reduced and most of the people left the mountain to go to live elsewhere. In 1974 the forest property of the Italian State was handed over to the Lombardy Region. Covering an area of 13.000 hectares this is now the largest forest belonging to the Region.

The area now has now a very high percentage of forests cover and a very high biodiversity value, with a wide range of different environments: from the Mediterranean ecosystems of the coasts to the sub alpine vegetation of the upper mountains. In the last decades the use of the forests has not been very intense, and most of the silvicultural activities have been carried out to fulfil conservation objectives. At the same time the traditional knowledge and traditional woodland management techniques has been rapidly disappearing and only few individuals are still continuing to work in traditional way.

### 3.3. Restoring the physical woodland resource

Starting from the 1950's the upper Garda and the Valle Sabbia area have seen a spontaneous restoration of native forests by natural regeneration. This has mainly been a consequence of the depopulation of the area, the reduction in pastoral grazing systems and the decrease of economical interest in the timber products of the local woodlands. The recolonisation of grassland by trees and shrubs has been the main process of concern to conservationists interested in the upper Garda and Valle Sabbia mountains.

The area has several main types of woodland cover:
- mesophilous broadleaved woodland – largely managed as coppice with predominance of Beech (*Fagus sylvatica*),
- Semi-mesophilous to slightly thermophilous broadleaved woodland (largely managed as co pice, referable to the Orno-Ostryon, with *Ostrya carpinifolia* as predominant species);
- Scots Pine (*Pinus sylvestris*) woodland,
- Mountain woods dominated by Fir (*Abies spp.*),
- Chestnut (*Castanea sativa*) woods (grow in small areas, especially near cultivated zones),
- Sparse Mugho pinewoods (at the upper limits of the forest, sub-alpine shrub vegetation is mainly characterized by *Pinus mugo*).

The maintenance of the biodiversity of the area and the natural restoration of the forests have been the keys elements of two LIFE projects focused upon the Natura 2000 sites in Valvestino.

The goals of these projects were:
- enhancing the ecological integrity of the forest, including the composition, structure, and function,
- increasing ecosystem resilience to disturbance events, including fire, drought, insect infestation, and climate change,
- restoring the natural distribution of tree ages, sizes, and spatial structures,
- encouraging the development of a diverse understory community of plants,
- enhancing habitat for imperiled and sensitive species,
- decreasing excessive tree competition to protect and invigorate old growth trees and encourage the development of old growth structure.

In conclusion it is possible t say that in the last decades the woodlands have been expanded so much that today to maintain the biodiversity of the area, it has become necessary to contain the woodland colonisation of the remaining limited patches of open spaces (which are themselves species-rich grasslands maintained by traditional grazing regimes).

### 3.4. Re-connecting people with woodlands

The project has been funded by the LAG Gardavalsabbia together with the Alto Garda Natural Park, the Regional Forest Agency (ERSAF Lombardia) and the Province of Brescia decided (for a total amount of 200.000 euros). The realisation of the project has been mainly organised by the Consorzio Forestale della Valvestino as a partnership between members of the local community and representatives from local agencies and funding partners (see below) and it has proved to be an excellent opportunity to open a discussion between private and public partners about the utililisation of woodland in the area of upper Garda and Valle Sabbia.

The composition of the Consorzio partnership between public and private members is described in Table 1.

Table 1. The Consorzio Forestale della Valvestino partnership

| | |
|---|---|
| Private land owners | 73 |
| Municipality | 5 |
| Mountain community | 1 |
| Natural Park | 1 |
| Local enterprises | 8 |
| Charity | 2 |

The decision to manage the project directly from one of the most fragile and socio-economically challenged areas has been one of the main challenges for the project itself. In this way it has been possible to encourage the local community to have an exchange of experience within the area and together with the Scottish partners, around a subject that was never before considered to be of great importance. At the same time this has been the first experience of a transnational cooperation project for most of the partners involved. Such experience ties in well with the original aim of the Consorzio Forestale of Valvestino – a candidate itself to become a Local Development Agency of the Upper Garda Mountain area. In fact the original idea to create communication, interest, activities, job opportunities and economical development based on woodland, as the main resource of the area, has found in this project a very successful vehicle for further development.

The project has been organised in terms of three different groups of 'actions': preliminary, material and animation actions:

- The preliminary actions have been to investigate the traditional knowledge linked with the use of local woodland within the Leader+ area. In this way some older people still using ancient and traditional techniques have been involved in the project. Another preliminary action has been the creation of a local network between people working in the field of woodland management and wood utilization.
- After this with the material actions the EU funds have been used to create a workshop and multimedia centre for training at the Consorzio offices in Valvestino. At the same time a saw mill equipment has been purchased and a local cooperative has been crated to manage it.

- After the completion of the project infrastructure an animation programme has been initiated including seminars, workshops and international cultural exchanges. This has included a project done with the local school called 'from the tree to Pinocchio' an important exchange of experience and knowledge between old people and children of the nursery. At the same time local and international workshops have been carried out on woodland management and utilisation, art and woodlands, charcoal production, traditional thatching techniques, saw-milling expertise and wood turning.

This project has created the opportunity to give to the fragile and relatively remote mountain communities of the GardaValsabbia Leader+ area the confidence to work in cooperation with other communities of different countries, and has provided their first opportunity to use EU funds for rural development. At the same time the comparison between different ways of managing the project and the use of a participative approach has been an important value for both of the local communities.

## 4. Conclusions

The opportunity for the local communities living in two economically disadvantage areas in Scotland and northern Italy to cooperate in a Leader+ project on wood utilisation has been positively tested. Both the communities seems to be proud of their knowledge and interested to discover their values and traditional knowledge to compare with the experience of their European partners.

At a local level the main results of the project have been the improved connections with local people with disappearing/unknown skills, and the fostering of a more outward-looking perspective. The transnational collaboration has also developed a kind of solidarity in looking for continuous and ongoing opportunities for engagement and collaboration, links with other projects (e.g. rural tourism) and looking for markets for 'added-value' of woodland products.

However, our experiences of this project also leave most of the people involved in the project, especially the younger ones, with a final question: are we recovering traditional knowledge and are we "creating' or 're-creating' a woodland culture? Traditional forest knowledge and culture can and should be recorded and preserved. However, at the end of the day, it is not a static artefact, but the dynamic and cumulative product of a community that is directly involved in the management and ownership/stewardship of forested lands. The daily work of foresters, craftspeople, firewood users, crofters and small-holders in combination with the arts, music and spoken language of the area is what is rekindling and maintaining a 'woodland culture'. This (if anything) will be what policy-makers and academics a century from now refer to as 'traditional forest knowledge' when they meet to discuss the topic!

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# Forest landscape cultural heritage inventory: an Estonian model

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## Abstract

The paper focuses on investigating the development context, the content and the realization conditions of forest landscape cultural heritage inventory, currently convened in the frame of EC INTERREG IIIA programme in Estonia. Prior to this project, assessment works for establishing Natura 2000 network as well as spatial planning considering valuable cultural/historical landscapes at county level have been the closest inventories to forest landscape cultural heritage inventory conducted in subject area. The methodological pilot study accomplished in 2003, has been recently followed by inventory lead by State Forest Management Centre covering three counties. The features specified in the course of this forest landscape cultural heritage inventory, including 102 main types of heritage features, have not been considered as objects of any sort of systematic inventory, neither have these been objects national heritage protection. A special attention to public awareness and participation in this project is paid. *Inter alia* all local authorities and forest owners have been contacted and agreements of understanding have been made. Introduction of the topic to forest owners, forest organizations and local authorities should improve understanding of their heritage values and applicable opportunities for forest multiple uses.

## 1. Introduction

The post-1990s have brought about a large variety of activities of reconsideration and re-illumination both natural and cultural values in Estonia. New national policies of concerned sectors (e.g. Environmental Strategy, 1997, Forest Policy (1997) and Forestry Development Programme (2001), the long-term spatial strategy "Estonia – vision 2010" (1999), Tourism Development Plan (2004), etc.) have included variety of aspects for cultural heritage promotion.

So far, prior to forest landscape cultural heritage inventory, two general series of inventories have to a certain extent encompassed the elements relevant to forest landscape cultural heritage assessment. The first one focused on evaluating habitats and other biodiversity values and was carried out as preparatory works for establishing Natura 2000 network (1994-2004). This work has spotted out several ecosystems with cultural heritage value, like wooded meadows and other semi-cultural forest grasslands of different origin. Another series of inventories were carried out to define valuable cultural/historical landscapes, as a part of spatial planning at county level (1999-2002), foreseen by law. Hence, the landscape zones with prioritized value, including forest areas were distinguished basing on cultural-historical, aesthetical, recreational, nature and identity characteristics.

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## 2. Forest heritage inventory

Landscape has often been compared to palimpsest – meaning a medieval writing block where an original inscription would be erased and another written over it (Crang 1998; Marcucci 2000). Alike, culture inscribes itself on the landscape as the sum of erasures, accretions, anomalies and redundancies over time (Figure 1). Traces of different times force their way into the present. The pattern of accumulated forms and change suggest a lot about the evolution of the landscape and the local culture. It implies that landscape has been shaped by and is shaping the people living there, thereby becoming a bank of cultural memories – some still in use, other as residues of past practices and knowledge (Johansson 1993).

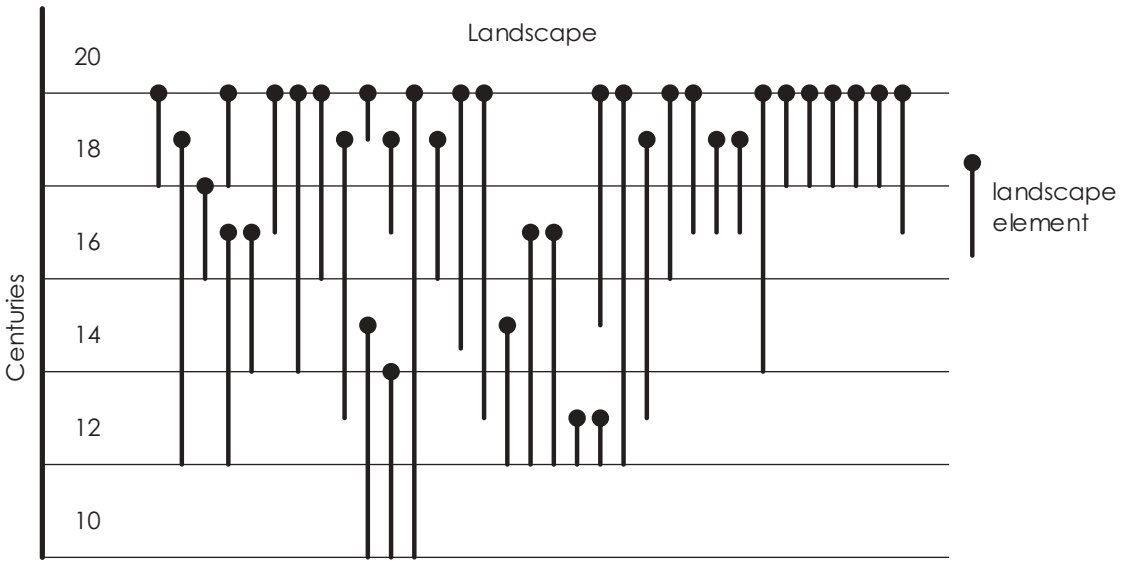


Figure 1. Cultural landscape as a palimpsest (after Vervloet 1986 and Palang et al 2005). Some landscape elements have remained the same through all the changing socio-economic formations. Some others have been forgotten or destroyed by the emerging formations. Some other places have retained their physical structure, but the meanings have changed. Landscape is thus the collection of inscriptions by all formations, where one can still recognize excerpts of different time periods.

The detailed assessment with the distinction of heritage elements in forest landscape started with a methodological pilot study by L.Tarang and R.Kaljuvee in 2003, combining the registration methodologies used by archaeologists, conservationists and foresters in sample plots. The list of registered high-value landscape elements includes historical forest melioration ditches, old rides, boundary stones, stone fences, traditional sleddings, bog-crossings, stone cellars, forest retreats, bush-rangers' bins, old culverts, bridges, historical roads and tracks, boundary marks etc. About 50000 ha of various forest types and administrative units (including a national park) have been covered by the pilot inventory in Lääne and Rapla counties by date (Kusmin 2005).

Throughout the pilot period the inventory methodology has been customized and advanced to include 102 main types of heritage features. The type classes include: 1) heritage related to cultural landscape genesis, 2) natural or semi-natural heritage, 3) heritage related to human activities, 4) constructions, buildings and facilities heritage, 5) military heritage and 6) forest cultural heritage. The registry fill-in form contains 23 fields including inter alia the registry code, site description, status assessment, forest stand description, GPS-coordinates, digital image and GIS application (Figure 2) (ibid.).

Figure 2.
Map window in the MapInfo GIS software showing the photo of the object and the data table record

The current project team is lead by State Forest Management Centre and includes partners like Forestry Development Centre Tapio, Finland, Ministry of Culture, Ministry of Social Affairs, Estonian Heritage Society, Estonian University of Life Sciences, Estonian Private Forest Union and local authorities.

Inventory team consists of 2 groups of 25 persons (including a member of each local rural municipality), who have received special training.

### 3. Awareness and participation

Currently less and less owners live in their farms as well as more work in forest is done by contract workers with little acquaintance of actual forest. This situation leads to less knowledge of and feeling for the cultural and natural values of forests present during actual operations.

So far an opinion has prevailed that the main motive for conservation interest conflicts is insufficient knowledge on values or fear on discontinuity of former natural resource uses (Stoll-Kleemann 2001). The latest views consider also the social environment of the conservation process itself – how participatory the conservation activities like planning, inventarization, implementation and enforcement are performed – of the high importance (Clayton &Brook 2005, Hiedanpää (In Press)).

Following the Scandinavian experience and knowledge from preceding inventories of forest ecological and cultural values (e.g. Kulturmiljövard… 1992, Grön… 1998, Aronsson 2005) special attention to public awareness and participation is paid in this project. Prior to the inventory all local authorities have been contacted and agreements of cooperation were contracted. Further, forest owners and/or owners' associations have been contacted and agreements have been made likewise. In parallel to the heritage inventory, an assessment on compliance of multiple uses of forest among forest owners, forest officers and forest associations has been carried out. The assessment shows a slight awareness rise in recent years. In cooperation with the partnering Finnish forest and tourism organisations the development needs, conflict points and good local solutions were mapped.

The features specified in the course of this forest landscape cultural heritage inventory have been considered earlier as "too far ordinary" and have not been considered as objects of national heritage protection, neither have these been objects of any sort of systematic inventory. So far most of heritage values of this category have had conservation status as coinciding within nature or environmental protection schemes only.

The ascertainment and notification via inventorying will facilitate enhancing and protecting the elements of forest landscape cultural heritage, as the legal system does not generally provide any solution so far.

The roundtable of concerned stakeholders (e.g. Estonian Forest Society, Estonian Heritage Society, Society of History Teachers, Ministry of Environment, University of Tartu, etc.), which was assembled in 2005 and signed an appeal for natural heritage conservation, including legal, economical and social aspects, addressed to the national Parliament and Government, can be considered as a principal milestone in the process achieving political consensus.

The undertaken project uses the momentum of best conservation options for today: introduction of the topic to forest owners, forest organizations and local authorities. The landowners' understanding of their heritage values and applicable opportunities for forest multiple uses (for non-timber uses especially) can open up the avenues for further persistence of these values.

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