Coppice Forests in Europe - A Traditional Landuse with New Perspectives

Gero Becker and Alicia Unrau

For many people in Europe, the image that comes to mind when thinking or speaking of forests is a landscape with an extensive area of woodland that is permanently stocked with tall trees of medium to large diameter. Depending on the region, these forests may be coniferous or broadleaved, or a mixture of both. When trees are cut, it is done selectively, or in clearcuts, and regeneration occurs either naturally by seed, or through artificial re-planting. Long rotation cycles (often between 50 and 100 years) lead to harvested trees of large dimensions, which are used in sawmilling and for other high-end wood products. All of these traits are typical of the "high forest" management regime.

When traveling across the continent, especially in the middle, south, east and Mediterranean regions, vast areas of the landscape are covered with a completely different type of forest: The broadleaved trees of these regions are often short, crooked, of small diameter and can be quite dense. Many stems originate from the same stump, giving the forest a bush-like appearance. This more or less uniform picture is occasionally interrupted by smaller clearcut patches, where trees have been recently cut and very young shoots are now sprouting again from the old stumps. Short rotation cycles, resulting in harvested trees of smaller sizes, are typical for this "coppice forest" regime.

The origin of coppice management

Historically, coppicing is the oldest form of forest management and utilisation to take place in a systematic and, in many cases, sustainable way. Our ancestors, mostly self-sufficient farmers that settled in small and isolated villages, depended on forest resources for their survival: They used the wood for cooking and heating, fencing, building houses and for all kinds of furniture and tools. They collected the foliage of the trees to feed their animals, used bark for tanning and insulation, and collected fruits, berries and mushrooms from the forest to complement their diet. They did not have the technical means to transport heavy logs over long distances, so trees were harvested close to home, at a younger age and smaller size, using hand tools and transported by hand or draft animals to the nearby settlements.

The people of those times knew very well -and made use of- the natural capability of some tree species to sprout vigorously and repeatedly from the stump that remains after being cut, as is the case with oak, hornbeam, linden, black locust, willows, poplars and others. They deliberately cultivated these species in the vicinity of their villages and developed increasingly sophisticated management rules and techniques to optimise the outputs of coppice forests over generations. It can be observed that the coppice techniques sometimes developed in parallel to specific socio-cultural arrangements, such as common ownership or cooperatives. Thus, rural societies managed and utilised their forests in a way that made the best "sustainable" use of their natural resources.

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It can be stated that throughout Europe, until the end of the medieval period, the majority of accessible forests were very intensively used and managed as coppice forests. The only exceptions were woodlands claimed by kings and other nobles for exclusive use, most often for hunting purposes; these forests were managed by trained forester-hunters. Their utilisation by the local subjects for wood procurement and cattle grazing was strictly limited and controlled, resulting in less pressure on the resource and, as a consequence, in a different type of management.

The influence of the industrial revolution

With the development of early industry in some regions of Europe, technology, markets and social structures changed. Industrial activities such as mining, steel, glass, pottery and textiles appeared, generally close to the places where the respective commodities were found. Wood was the only available source of energy for processing and still the preferred material for building. As a result, the demand for wood increased dramatically. Coppice forests were an appropriate and established way to supply these industries with large quantities of wood in short time and at low costs. Thus, large coppice forest areas were actively managed surrounding those centres of early industries (good examples are the regions of Sauerland, Tuscany, Limoges and England). They were often owned by noble families acting as entrepreneurs and were managed intensively, providing not only wood products, but also labour and income for rural inhabitants. In some cases, forests were over-used beyond their natural capacity, leaving devastated and poorly stocked woodlands.

Coal mining activities began in the middle of the 18th century, prompting industries, as well as the urban households, to meet their growing energy demands by gradually replacing wood with coal. Moreover, once water, road and railroad infrastructure had been improved, it was feasible and economical to transport fossil energy to much more remote areas. In consequence, the demand for energy wood decreased, while that for rural and urban construction wood, along with technical uses of wood, such as mining or paper, increased. Man-made plantation forests were established by planting or seeding, often with relatively fast-growing conifer species, and managed as high forest, applying selective thinning and longer cutting cycles to meet the industrial demand for long and straight trees of larger dimension. Forest science was developed to study and to implement modern silvicultural methods in order to increase the productivity and to guarantee a sustainable use of these high forest systems.

These trends have continued until recent times, leading to the current situation around industrial and urban centres, where coppice forests have either been replaced by high forests or abandoned, depending on the owner and the prevailing socio-economic conditions of the respective region. In rural areas, inhabitants long relied on wood for their daily lives and coppicing was still actively practiced for many decades - in many places it still is today.

Recent developments

All in all, it is estimated that there are currently well over 20 million hectares of European woodlands that are mostly managed as coppice, while many more are of coppice origin. Although the figure is difficult to assess, it comprises over 10 % of the total European forest area. The national and geographic variation is great, ranging from a negligible amount in northern countries, such as Finland and Sweden, to over 50 % of the total forest area in Serbia and Bosnia & Herzegovina.

Despite this relative importance, there is actually quite sparse grey and scientific literature on coppice and it is still stigmatised on many

societal levels. Due to the historical development described above, coppice forest management has been somewhat "out of fashion" or even "forgotten" during the past decades. It was rarely discussed or even recognised in forest science and in national and EU-forest policies and the main emphasis of professional activities is still on high forest management.

Only recently has the idea and concept of coppice forest management gained attention once more. The main reasons behind this new interest have been: (1) the debate on climate change and a CO_2 neutral economy: fast growing, easy to manage and cheap to harvest dendrobiomass from coppice forests are being recognised as a valuable and abundant, but underused natural resource to provide feedstock for green energy and the bioeconomy; (2) new research results on biodiversity and nature protection have identified coppice forests as resilient ecosystems that give shelter to a unique composition of species and are less vulnerable to certain types of biotic and abiotic risks; (3) efforts are being made to acknowledge and improve the situation of those in in rural areas, as it is (re-) discovered that coppice forests and the related wood and non-wood products can be a source of rural employment and income.

Into the spotlight with COST Action FP1301 EuroCoppice

This was the starting point from which FP1301 EuroCoppice, an "Action" within the framework of COST (European Cooperation in Science and Technology), was launched. It brought together researchers and experts from 35 countries together for four years of cooperation on a broad range of themes related to coppice forests.

Action members recognised the pitfalls and opportunities of the topic, such as:

- The geophysical situation, but also the socio-economic backgound in Europe are so diverse, that many different ways and means to practice coppice forestry developed over time at the regional and national level. Thus, there is no common European understanding between officials, scientists and stakeholders, on the role and the future potential of coppice forest management.
- Much coppice-related knowledge exists, but it is regionally/locally scattered and rarely communicated amongst the European scientific and professional community.
- This lack of consistent and common knowledge base prevents the exchange of lessons learned and of new ideas, prohibiting an effective handling and use and further development of this interesting and trendsetting management concept.

EuroCoppice was the first major international cooperation to focus on coppice forest management. Besides many on-site activities and events to collect and exchange coppice related information, the efforts of the members resulted in quite a number of written documents, which have been edited and are communicated in this volume, "Coppice Forests in Europe".

Contents of this edited collection

The volume begins with very broad, general information on coppice, before diving into the details of different coppice themes, related to ecology, management and policy. The second half is then focussed on the situation in different countries, before giving a short summary and conclusion.

(1) The articles in the rest of this chapter, **Overview**, give brief descriptions of the different types of forest, first in a mainly text-based format, then the typology in a table format. Finally, for those unfamiliar with certain terms, the Glossary provides a first point of reference that can be accessed as necessary.

(2) The second chapter on **Silviculture** features comprehensive guidelines on coppice forests in Europe, compiled by a large number of experts

from across Europe, making it a key document for further cooperation and development in both science and practice. The focus then narrows to the role of two particular invasive species, before the final article transitions to the coming chapter by linking silviculture with utilisation.

(3) Having already touched on the topic of **Utilisation** in the previous article, this chapter begins with an overview about the various products from coppice forests, both wood and non-wood. This illustrates that coppice management is a very flexible production system that can be adapted to the actual needs of the population. After this, a second set of comprehensive guideline presents the different possibilities of coppice harvesting. The next contribution is devoted to the interaction between harvesting systems and their impacts to the soil, with recommendations for low impact systems.

(4) Moving on from the products-focussed research, the fourth chapter on **Conservation** encompasses articles on subjects such as the biodiversity, protective function and cultural heritage of coppice forests and their ecosystems. While the first two contributions highlight coppice in Natura 2000, the third is an extensive review of literature related to erosion and rockfall. A case study from the Czech Republic illustrates the effects of changing socio-political frame conditions on coppice in that country.

(5) Continuing on the societal theme, the next chapter on **Governance** outlines the influence of socio-economic aspects on the management of coppice forests in several European regions, then touches on the barriers that prevent small scale landowners from successfully managing their coppice forests. The picture is completed with an example of a community-owned and managed coppice forest in Serbia.

(6) Having finished with theme-related contributions, the sixth Chapter comprises reports on the **Thirty-Five Countries** that were involved in EuroCoppice, nearly all of which are in Europe. They include facts and figures, maps, descriptions and forestry regulations, as well as a summary of a selection of the main data. These contributions are a valuable source of detailed, country-specific information on coppice forests in Europe, which has never before been presented so comprehensively.

(7) After these many theme and country related articles, the **Outlook** summarises the consequences of all the facts and findings that have been gathered throughout the four years of COST Action FP1301 EuroCoppice. Conclusions are drawn and recommendations are given for decisions and activities on EU and national level with the aim to conserve, further develop and promote coppice forests in Europe.

(8) Finally, those interested in the activities and members of the Action should visit the **Annex**. Of particular interest could be the final article on the newly-formed IUFRO Unit on traditional coppice; it is open to any researcher worldwide who has a special interest in coppice forests.

Despite being comprehensive, this volume is not able to address all aspects of coppice in the same depth and it reflects the interests of the contributors. It will hopefully stimulate and encourage further research on the subject.

Closing remarks

Coppice has been –and in many cases still is– an important traditional forest land use across Europe. Its development is closely related to human efforts to establish a sustainable management of forests with a minimal input of scarce resources, such as energy, capital and land. It's still unclear whether this type of forest will again become a recognised, perhaps even prominent, element of European landscapes in the near future… For the time being, read on to discover and explore the many faucets of this fascinating, but half-forgotten land use system and let yourself be inspired, be it on a practical, scientific or political level.

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