The Status of Coppice Management within Forested Natura 2000 Sites

Paola Mairota and Peter Buckley

Most forest habitats that are listed for their nature conservation importance in the Habitats Directive of the European Union and the Bern Convention have been modified for centuries by human intervention. It is well documented that many forests throughout Europe were traditionally coppiced (cf. Piussi & Redon 2001; Kirby & Watkins 2015), thus influencing the woodland ecology not only at the stand level, but at wider spatial (landscape) and temporal scales, creating specific communities that are often the focus of nature conservation initiatives. As such, coppice management falls within the scope of the Habitats Directive (Council Directive 92/43/EEC; European Commission 2003; Loidi & Fernandez-Gonzalez 2012). However, this form of silvicultural system has become obsolete in many of the EU28 countries, particularly those in the north and east, whereas in others it is still very relevant to the country's economy (Figure 1). Nowadays, the trend towards non-intervention in coppice stands, or their conversion to high forest, is the de facto approach within areas protected for conservation.

In order to examine prevailing attitudes towards coppicing within sites designated under the Natura 2000 framework as Sites of Community Importance or Special Areas of Conservation (SCIs or SACs), a study was carried out within the framework of the EuroCoppice COST Action FP1301 to examine the relevant Site Management Plans (SMPs) in six participating countries. The aim was to sample the extent to which different countries recognised coppicing activities, and what extent they considered alternative options that might better secure the conservation status of the habitat in question (The full study is available in the open source iForest article Mairota et al. 2016a). These six countries (Belgium, Czech Republic, Estonia,

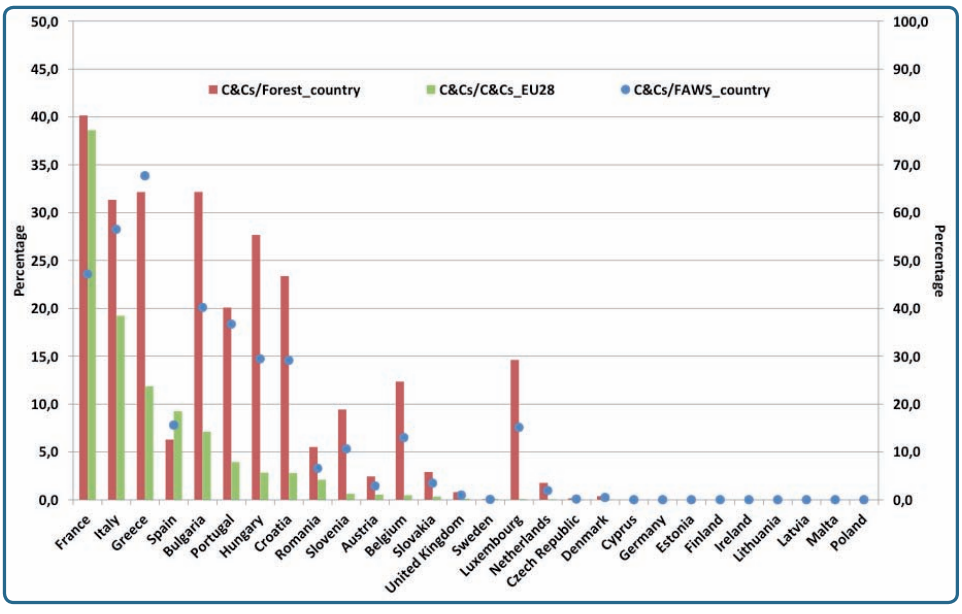

Figure 1. Left axis: Share of simple coppice (C) and coppice with standards (Cs) woodlands over the forest area of the country (C&Cs/Forest-country), and share of country simple coppice and coppice with standards in the EU (C&Cs/C&CS EU); Right axis: Share of simple coppice/coppice with standards woodlands over the forest available for wood supply in the country (C&Cs/FAWS country) (Processed from UNECE-FAO 2010 data)

Corresponding Author: Paola Mairota, paola.mairota@uniba.it

Germany, Italy and the United Kingdom), represent a range of EU Biogeographical Regions, including both small and large regions, different administrative systems (centralized to devolved) and greatly differing amounts of forest cover. In addition, a sub-national level (at either the NUTS1 or NUTS2 regional scale) was chosen to review Natura 2000 Site Management Plans (SMPs) for three of these countries (Germany, Italy and the United Kingdom).

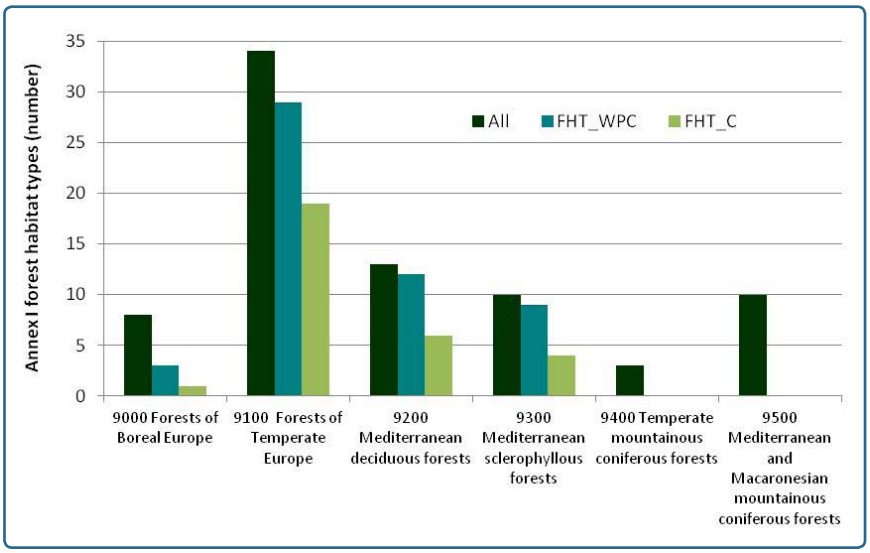

Figure 2. Distribution of forest habitat types in the main forest categories according to the Habitats Directive and incidence of both forest habitat types with potential for coppice and forest habitat types for which coppice is reported in the sample countries.
FHT_WPC: forest habitat types with potential for coppice;
FHT_C: Forest habitat types which have been coppiced historically.

The share of Natura 2000 area in the sample countries is comparable to the EU28 terrestrial average, which is 14.6%. Of this, 73.9% is protected under the SCIs and SACs of the Habitats Directive, while the remainder falls under the Birds Directive. However, progress in formulating SMPs in compliance with the Habitats Directive's recommendations varies widely between the EU countries, as is mirrored in the six sample countries. In Italy there are a number of NUTS2 regions without enforced, or even envisaged SMPs, but here compliance to the Directive is ensured by collective conservation measures for those habitat types belonging to the same biogeographical zone (IT-D4 Friuli Venezia Giulia), or macro-environmental category (IT-C1 Piemonte and IT-F4 Puglia).

As a general tendency, it appears that a greater proportion of forest areas were designated as SCIs/SACs than many other habitats. The majority (68 %) of the 78 Annex I forest habitat types recognised by the Habitats Directive have the potential to be coppiced, i.e. the dominant species is capable of resprouting. This ability varies among the main forest habitat categories (i.e. 9000 'Forests of Boreal Europe', 9100 'Forests of Temperate Europe', 9200 'Mediterranean deciduous forests', 9300 'Mediterranean sclerophyllous forests') (Figure 2).

In the sample countries, 38% of the habitat types were considered to have been coppices in the past, with more and more evidence to this effect being reported (e.g. Madera et al. 2017). However, coppicing is no longer allowed in Estonia (where non-intervention is the current management strategy in protected areas), while it is only allowed for research purposes in the Czech Republic. Management prescriptions for coppices in SCIs/SACs tend to be rather strict in Italy (detailing specific aspects such as coupe size, rotation length, number of standards, standard age category, sporadic tree species release and canopy cover). Conversely, coppicing done to conserve particular target species is still practised in parts of the United Kingdom and Germany. Similar signs of a strict conservation interest have in fact also been noted in Italy (Negro et al. 2014), where a debate has recently begun between the Italian chapter of Pro Silva

(a Europe-wide association of silviculturists) and two national scientific societies dealing with vegetation science (SISV) and forest ecology (SISEF).

A closer look was taken at a number of SCI/SAC management plans (172 SMPs, 51% of those available) of five administrative regions in three sample countries (IT-E2 Umbria and ITF-4 Puglia (NUTS2), UK-J, South East England and UK-L Wales (NUTS1), and DE-B Rhineland-Palatinate (NUTS1). This revealed that coppice management was rarely encouraged and that conversion to high forest was often thought desirable. While the justification for this view was seldom provided, other than in generic/anecdotal terms, it was frequently argued that high forest could achieve higher financial returns, or that high forest, regenerating from seed, was the more 'natural' condition. That being said, no scientific study has thus far convincingly demonstrated that a high forest/wilderness state could achieve a more 'favourable conservation status' than that provided by coppice in most SCI/SAC forest habitats (European Commission 2013). On the other hand, a number of studies have provided increasing evidence of the importance of coppice in promoting biodiversity through its provision of open habitats (e.g. Garadnai et al. 2010, Mölder, 2010, Müllerová 2015).

SMPs generally addressed the notable species listed in Annex II where they occurred within the habitat, but were less concerned with other species that might benefit from coppice management (Buckley and Mills 2015). This is in spite of the Habitat Directive's aim to protect the habitat per se, with its array of characteristic (but not necessarily rare) species; in this case, species that are frequently associated with the mosaic of age classes created by coppice woods or coppice-with-standards.

Another common feature was that, notwithstanding differences in the amount of detail required by the individual regional authorities dealing with SMPs, these plans were often rather descriptive or aspirational documents and provided no comprehensive management prescriptions or schedules. Their utility as the first level of a cascade process for integrated landscape/forest planning (sensu Baskent & Keles 2005) is therefore very limited. This is concerning, because decisions to abandon coppice at the stand level, or to select another (high forest) silvicultural solution, has a strong impact on forest landscape structure and functioning and could affect some key elements of biodiversity. A number of technical practices, such as the group selection of standards or single tree silviculture, when combined with non-intervention and conversion to high forest, have the potential to increase forest landscape micro- and macro-heterogeneity (Cf. Mairota et al. 2016b). This is a desirable objective in order to maintain high levels of beta-diversity in the long run (e.g. Hunter 1990, Buckley 1992, Fuller & Warren 1993, Mairota & Piussi 2006, Chiarucci et al. 2008, Garadnai et al. 2010, Kopecký et al. 2013 and Buckley & Mills 2015).

A case can be made for a more balanced approach to forest management (combining coppice, high forest and non-intervention), as this appears most likely to revive and maintain specific forest landscape habitats and site conditions, as well as revitalise local economies. Overcoming socio-economic factors and, especially, the cultural factors behind SMP strategies and attitudes is necessary. One factor that may become important is the increasing demand for wood for energy (Mantau et al. 2010, UN-ECE-FAO 2011). In response to the EU Renewable Energy Directive 2009/28/EC and in compliance with the Framework Program for the Forestry Sector, Horizon 2020 should improve the transparency of wood-fuel flows in agreement with the EU 995/2010 Timber Regulation.

References

Baskent EZ, Keles S (2005). *Spatial forest planning: A review*. Ecological Modelling 188: 145-173.

Buckley GP (ed) (1992). *Ecology and management of coppice woodlands*. Chapman & Hall, London, UK, pp. 336.

Buckley GP, Mills J (2015). The Flora and Fauna of Coppice Woods: Winners and Losers of Active Management or Neglect? In: *Europe's Changing Woods and Forests: From Wildwood to Managed Landscapes* (Kirby K, Watkins C eds). CABI, Wallingford, UK, pp. 129-139

Chiarucci A, Bacaro G, Rocchini D (2008). *Quantifying plant species diversity in a Natura 2000 network: old ideas and new proposals*. Biological Conservation 141: 2608-2618.

European Commission (2013). *Guidelines on Wilderness in Natura 2000*. Technical Report 2013/069. Office for Official Publications of the European Communities, Luxembourg, pp.98

Fuller RJ, Warren MS (1993). *Coppiced woodlands: their management for wildlife*. Nature Conservation Committee, Peterborough, UK, pp. 29

Garadnai J, Gimona A, Angelini E, Cervellini M, Campetella G, Canullo R (2010). *Scales and diversity responses to management in Beech coppices of central Apennines (Marche, Italy): from floristic relevés to functional groups*. Braun-Blanquetia 46: 271-278

Hunter Jr ML (1990). *Wildlife, forests, and forestry. Principles of managing forests for biological diversity*. Prentice Hall, Upper Saddle River, New Jersey, USA, pp. 370

Kirby, K. J., Watkins, C. (eds) (2015). *Europe's changing woods and forests: from wildwood to managed landscapes*. CAB International, UK

Kopecký M, Hédl R, Szabó P (2013). *Non-random extinctions dominate plant community changes in abandoned coppices.* Journal of Applied Ecology 50: 79-87.

Loidi J, Fernández-González F (2012). *Potential natural vegetation: reburying or reboring?* Journal of Vegetation Science 23: 596–604

Madera P, Machala M, Slach T, Friedl M, Cernušáková L, Volarík D, Buček A. (2017). *Predicted occurrence of ancient coppice woodlands in the Czech Republic*. Iforest 10:778-795

Mairota P, Buckley P, Suchomel C, Heinsoo K, Verheyen K, Hédl R, Terzuolo PG, Sindaco R and Carpanelli A (2016a). *Integrating conservation objectives into forest management: coppice management and forest habitats in Natura 2000 sites.* i-Forest 9:560-568 doi: 10.3832/ifor1867-009

Mairota P, Manetti MC, Amorini E, Pelleri F, Terradura M, Frattegiani M, Savini P, Grohmann F, Mori P, Terzuolo PG, Piussi P (2016b). *Opportunities for coppice management at the landscape level: the Italian experience*. iForest 9: 775-782. – doi: 10.3832/ifor1865-009

Mairota P, Piussi P (2006). Gestione del bosco e conservazione della biodiversità: l'analisi eco-paesistica applicata a territori boscati della Toscana meridionale [Forest management and biodiversity conservation: landscape ecological analysis of wooded lands in southern Toscana (Italy)]. In: *Selvicoltura sostenibile nei boschi cedui [Sustainable silviculture in coppice woodlands]* (Fabbio G ed) Annali C.R.A. Istituto Sperimentale per la Selvicoltura. 33: 187-230

Mantau, U., Saal, U., Prins, K., Steierer, F., Lindner, M., Verkerk, H., Eggers J., Leek N., Oldeburger J., Asikainen A., Anttila, P. (2010). *Real potential for changes in growth and use of EU forests*. EUwood. Final report.

Mölder A, Streit M, Schmidt W (2014). *When beech strikes back: How strict nature conservation reduces herb-layer diversity and productivity in Central European deciduous forests.* Forest Ecology and Management 319: 51–61.

Müllerová J, Hédl R, Szabó P, (2015). *Coppice abandonment and its implications for species diversity in forest vegetation.* Forest Ecology and Management 343: 88–100.

Negro, M., Vacchiano, G., Berretti, R., Chamberlain, D. E., Palestrini, C., Motta, R., & Rolando, A. (2014). *Effects of forest management on ground beetle diversity in alpine beech (Fagus sylvatica L.) stands*.Forest ecology and management,328, 300-309.

Piussi P, Redon O (2001). Storia agraria e selvicoltura [Agrarian history and silviculture]. In: *Medievistica italiana e storia agraria* (Cortonesi A, Montanari M eds) CLUEB, Bologna, Italy, pp. 179-209.

UN-ECE/FAO (2000). *Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand (TBFRA-2000)*. ECE/TIM/SP/17, Geneva, Switzerland, pp. 466

Funded by the Horizon 2020 Framework Programme of the European Union

www.cost.eu

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

Published by:
Albert Ludwig University Freiburg
Chair of Forest Utilization
Werthmannstr. 6
D-79085 Freiburg
Germany
www.uni-freiburg.de

This article is part of the volume

"Coppice Forests in Europe"

Printed by: Albert Ludwig University Freiburg Printing Press

Contact:
www.eurocoppice.uni-freiburg.de
eurocoppice@fob.uni-freiburg.de
0049 (0)761 203 3789

Coppice Forests in Europe

Editors: Alicia Unrau, Gero Becker, Raffaele Spinelli, Dagnija Lazdina, Natascia Magagnotti, Valeriu-Norocel Nicolescu, Peter Buckley, Debbie Bartlett and Pieter D. Kofman

ISBN 978-3-9817340-2-7

Recommended citations:

For the full volume: Unrau, A., Becker, G., Spinelli, R., Lazdina, D., Magagnotti, N., Nicolescu, V.N., Buckley, P., Bartlett, D., Kofman, P.D. (Eds.) (2018). *Coppice Forests in Europe*. Freiburg i. Br., Germany: Albert Ludwig University of Freiburg.

For individual chapters/articles: List of author(s) with surname(s) and initial(s). (2018). Chapter/article title. In A. Unrau, G. Becker, R. Spinelli, D. Lazdina, N. Magagnotti, V.N. Nicolescu, P. Buckley, D. Bartlett, P.D. Kofman (Eds.), *Coppice Forests in Europe* (pp. xx-xx). Freiburg i. Br., Germany: Albert Ludwig University of Freiburg.

The articles in this volume were developed within the context of COST Action FP1301 EuroCoppice (2013-2017). Numerous contributions were published as single, independent booklets during the course of the Action; they were subsequently reviewed and updated for this volume. A digital version of this volume, further results and more are available on the website: www.eurocoppice.uni-freiburg.de

Design, layout & formatting: Alicia Unrau

Coppice image acknowledgements: Simple coppice (grey) based on a drawing by João Carvalho (pp. 46); Leaf vector originals designed by www.freepik.com (modified)