



FACTS AND FIGURES

Gero Becker and Alicia Unrau

Definitions

(1) Coppice: Even-aged stands consisting of trees and shrubs (mainly: *Quercus* spp., *Carpinus betulus*, *Alnus glutinosa*, occasionally *Fagus sylvatica*), which regenerate wholly or mainly by vegetative means (sprout or root shoot) and are harvested in small clearcuts (0.5-1 ha) in short rotations of 20-40 years. In some cases combined with standards, which have longer rotation periods.

(2) Short rotation coppice (SRC): Plantation of fast-growing trees (mainly *Populus* spp., *Salix* spp., and *Robinia pseudoacacia*), with the aim to produce in several short rotation periods (5-20 years each) wood as a renewable resource, mainly for energy.

(1) *Niederwald (Stockausschlagwald):* Gleichaltriger Bestand aus Bäumen und Sträuchern (hauptsächlich *Quercus* spp., *Carpinus betulus*, *Alnus glutinosa*, seltener *Fagus sylvatica*), die sich ganz oder überwiegend vegetativ (Stockausschlag, Wurzelbrut) verjüngen und in kleinen Kahlschlägen (0.5-1 ha) und in kurzen Umtriebszeiten (20-40 Jahren) bewirtschaftet werden. In einigen Fällen kombiniert mit aus Samen entstandenen Bäumen im Oberstand ("Kernwüchsen"), die in längerer Umtriebszeit bewirtschaftet werden ("Mittelwald").

(2) *Kurzumtriebsplantagen:* Künstlich angelegte Monokulturen schnell wachsender Bäume (hauptsächlich *Populus* spp., *Salix* spp., und *Robinia pseudoacacia*) mit dem Ziel, innerhalb kurzer Umtriebszeiten (5-20 Jahre) mit mehreren Wiederholungen Holz als nachwachsenden Rohstoff zu produzieren, vor allem für energetische Zwecke.

For National Inventory purposes, the definition is: "Coppice forests originate from vegetative regeneration (stool or root sprouts) and are max. 40 years of age" (BWI3 Guidelines, page 34).

Legal Framework

In Germany, the federal forest law only gives a general framework for legislation and provides no mention of traditional coppice. Forest issues are regulated in detail by regional authorities in 14 of the 16 states. They rarely mention traditional coppice and, if so, it is often indirectly. For example, in Bavaria there is mention of high forest ("Hochwald"), which implies that other types of forest exist as well, while in Rhineland-Palatinate they are generally considered "non-productive forests" and it is thus clear to all concerned that they fall under the legal category of "other forest" ("Sonstiger Wald"); neither case, however, explicitly mentions coppice ("Niederwald", i.e. low forest). In Bavaria there is another indirect link since remaining coppice forest stands can qualify as a historical land use practice, in which case they should be protected. Short rotation coppice ("Kurzumtriebsplantagen") is mentioned in federal and regional forest laws. They state that it is only regarded as "forest" if the rotations exceed 20 years; otherwise it is regarded as an agricultural crop.

Statistics

National statistics according to the third Bundeswaldinventur (National Forest Inventory) in 2012: Simple coppice 45,766 ha (0.42% of total forest area); coppice with standards 32,354 ha (0.30% of the total forest area) (BWI3). It should be noted that the definition of “Niederwald” in the BWI is limited to stands with a max. age of 40 years. Thus, older coppice stands are automatically defined as “Hochwald”.

In some regions (Rhineland-Palatinate, parts of North Rhine-Westphalia) the proportion of coppice may be as high as 5-10%. A recent study carried out in Rhineland-Palatinate shows that 20% (83,000 ha) of the state and community owned total forest area originated from and still shows signs of coppice forest (Becker et al. 2013). The proportion in private forests may even be slightly higher.

There are approximately 6,000 ha of Short Rotation Coppice in Germany; the plots are mainly experimental (Hauk et al. 2014).

Typology

Simple coppice	Small clearcuts; rotation 20-40 years
Coppice with standards	20-50 standards/ha, mostly oak, rotation >60-80 years, combined with coppice on a rotation of 20-40 years
Pollarding	Not significant
Short rotation coppice	<i>Populus</i> , in some cases <i>Robinia pseudoacacia</i> and <i>Salix</i> spp.

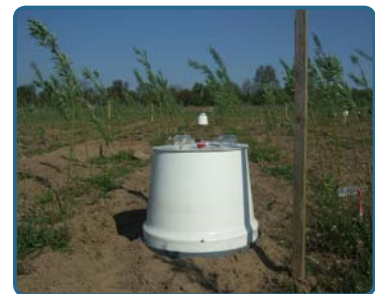
Images



Typical German coppice forest, Baumholder, Rhineland-Palatinate



SRC Poplar and willow, second rotation period



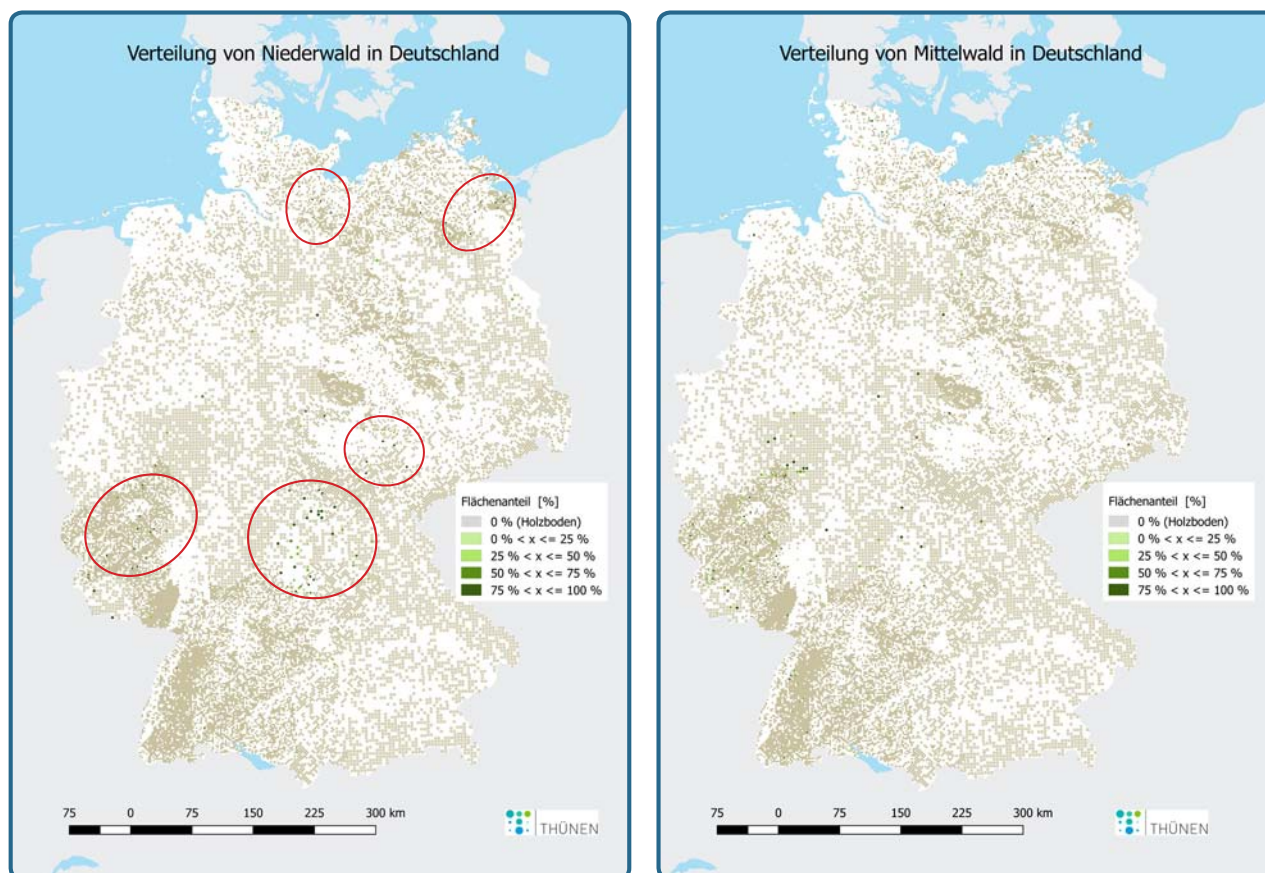
SRC 1 year old *Salix* and GHG measuring chamber

Photos: C. Suchomel

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Plots with active coppice (i.e. < 40 years of age) identified during the 3rd German Forest Inventory (green); Simple coppice (Niederwald) on the left and coppice with standards (Mittelwald) on the right. Circled in red on the left are the main areas of coppice, in which overaged coppice is also common (estimate).

Maps: Thünen-Institut, Dritte Bundeswaldinventur.

DESCRIPTION

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Coppicing is a traditional silvicultural management system applied all over the world. Until recently, coppice stands often represented important elements of the cultural landscapes in rural environments of Central Europe. These forests were traditionally used for the production of firewood and various non-timber forest products. Across Central Europe this practice was largely abandoned in the first half of the last century due to socio-economic changes and this absence of periodic coppicing led to the passive transformation of the remaining stands. In this process the stands

lose their typical coppice characteristics and increasingly resemble high forest. Subsequently the specific ecological values of coppice forests decreases and this important element of the cultural landscape gradually disappears.

Today, managed coppiced forests (i.e. younger than 40 years) only cover ca. 75,000 ha of Germany, which represents 0.7% of the total forest area (BWI3, 2012), while the forest assessment of 1961 reported 3.5% of German forests as coppice. One way of preserving the ecological, cultural and historical value of coppice forests would be to resume coppicing in overaged,

formerly coppiced forests with the additional benefits of promoting light and warmth demanding species. This could also increase biodiversity.

Ongoing initiatives by the European Union (EU) call for a substantial increase in the use of renewable energy sources. The objective is to provide one fifth of European energy consumption from renewable sources by 2020. Currently 47% of the renewable energy consumed in the EU is generated from forest biomass (i.e. wood and wood waste). This demand for biomass as an energy source has stimulated interest in resuming coppicing of forests that had undergone this management in the past.

Coppice forests are now regarded as cultural heritage features, as being a potential source of fuel wood and are recognised as valuable habitat for many plant and animal species. Despite this restoration by coppicing, particularly of aged, overstood coppice forests, it has proceeded slowly for various reasons. There are broad public concerns over the ecological sustainability, fostered by the media's focus on perceived environmental damage through clear felling. The fact that remnant coppice forests are often found on sites with low growth potential, such as steep slopes, makes economic justification difficult. The potential to convert overstood coppice stands into high forest has contributed to the current situation. One obstacle to resuming coppicing is the belief, held by some forest managers, that overstood oak coppice will not

re-sprout vigorously enough from the stump to ensure successful regeneration, combined with the view that coppicing causes a reduction in soil fertility.

Although most of these assumptions lack scientific evidence, some doubts are certainly justified. However, the fact that coppicing is the oldest type of regulated forest management can be considered as a clear indicator of its environmental sustainability. Recent research has shown that aged, overstood coppice forest can generally be managed in accordance with the pan-European criteria for sustainable forest management and that careful coppice management can preserve valuable and rare tree species such as *Sorbus torminalis* and *Sorbus domestica*. All forest managers should identify the basic situation, from stand to landscape level, at which coppicing is economically justified and needed in order to meet nature conservation objectives. It is important to conserve the remaining coppice forests and to continue their sustainable use and management.



Figure 1. Overaged coppice forests still dominate the landscape along the large Rhine and Moselle waterways

FORESTRY REGULATIONS

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German forest law gives the framework for forest management in Germany. More specific laws are given by the federal states. Historic management forms are mentioned in the context of the national forest law, where it is stated that cultural heritage and heritage

conservation should be taken into account (Bundesministeriums der Justiz und für Verbraucherschutz 1975).

In the **German National Strategy of Biodiversity**, which is a declared intention and not legally binding, historic management systems

such as coppice, coppice-with-standards and forest pastures are explicitly mentioned for their high value in conservation and recreation. The aim of the strategy is to continue to manage in this way and expand if possible. Historic relicts of forest management (for instance coppice) are intended to be preserved (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit 2007). Another strategy at national level is the **German Forest Strategy 2020**. Here, unique historical management systems such as coppice, coppice-with-standards and wood pastures are again confirmed as important habitats for flora and fauna, which rely on their traditional and particular management. The strategy places a high emphasis on conservation (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz 2011).

The **state forest laws** regulate clearcuts and the rules for their reforestation. All but three states specify the maximum size of a clearcut, ranging from 0,3 to 2,0 ha. Since periodic clearcuts are a genuine traditional forest management practice, the application of clearcut rules to coppice is under debate. Recently, it has been discussed whether coppice forests violate the prescription in Natura 2000 areas that forbids a deterioration of the current ecological situation.

To elaborate on the rules and regulations of the federal states related to coppice forests and their management, we selected the six federal states (out of 16) that have the highest percentage of the total recorded coppice and coppice-with-standards in Germany: Bavaria (37%), Rhineland-Palatinate (17%), Mecklenburg-Western Pomerania (9%), North Rhine-Westphalia (8%), Thuringia (8%) and Hesse (5%) (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz 2005).

Neither German nor state laws contain specific guidelines concerning felling heights, maximum size of coppice areas or the number of standards.

Select Federal States



Bavaria

In the Bavarian forest law, coppicing or other historical forms of forest management are not specifically mentioned. The state strategy for the conservation of biodiversity only refers to regulations concerning voluntary contractual nature conservation measures (Bayerisches Staatsministerium für Umwelt und Gesundheit 2009). Here the establishment and maintenance of coppice and coppice-with-standards forests, as well as the resumption of coppicing, is permitted as a so-called compensatory measure. The same strategy refers to the need for action in forests. In the relevant paragraph, coppice and coppice-with-standards are mentioned as examples of forms of forest management which should be facilitated due to their special importance for biodiversity.



Rhineland-Palatinate

Rhineland-Palatinate is the federal state with the highest share of forest area. It is especially in this part of Germany that aged oak coppice forests are a substantial and omnipresent in many forest landscapes. Inventories in public forests, together with estimations in private forests, show that more than 160,000 ha are still covered by overaged coppice forests (these are not counted as coppice in the national forest inventory (BWI3) because they are over 40 years age). It is thus all the more surprising that neither historical forms of forest management, coppice nor coppice-with-standards forests, are considered in the state forest law. The law only indirectly mentions coppice, when it refers to non-productive forests, where special administrative regulations apply. However, coppice forests are explicitly mentioned in the state Strategy for the Conservation of Biodiversity (Ministerium für Umwelt, Landwirtschaft, Ernährung, Weinbau und Forsten Rheinland-Pfalz 2015). In this strategy, coppice forests are

considered special habitats; their high nature conservation value should be given special consideration in the context of management.



Mecklenburg-Western Pomerania

The north eastern part of Germany belongs to the federal state of Mecklenburg-Western Pomerania. In the forest law of this federal state, coppice forests are only mentioned indirectly in the context of the so-called protection forests. Forests can be designated as protection forests if they are of importance for research, conservation of genetic diversity or the conservation of meaningful historical forms of forest management (Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Vorpommern 2011). Hence, coppice and coppice-with-standards could potentially gain specific protection status, but the selection criteria for these forests are not specified. The state forest law is supported by a governmental program for the conservation and development of biological diversity, where specific attention to historical forms of forest management is expressly requested until the year 2020 (Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Vorpommern 2012). In the relevant paragraph, coppice and coppice-with-standards forests are specifically mentioned in parenthesis. Both political instruments (Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Vorpommern 2011 and 2012) are presumably influenced by the state Forest Development Program, published by the Ministry for Agriculture, Food and Forestry in the year 2002. This program requires the promotion of historical forms of forest management, along with the conservation of native tree species and rare plants (Ministerium für Ernährung, Landwirtschaft, Forsten und Fischerei Mecklenburg-Vorpommern 2002).



North Rhine-Westphalia

In North Rhine-Westphalia, which is in north-west Germany, 6,000 ha of historical forests (coppice and wood pastures) are still actively managed. In the Biodiversity Strategy it is mentioned that these forests contribute in an important way to the preservation of biodiversity. One aim is to develop an immediate concept for the coppice area and a concept for forest edges to be managed as coppice-with-standards, so as to support light- and warmth-demanding species (Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen 2015). Coppice regeneration can be allowed by the administrators as a method by the forest law of North Rhine-Westphalia. Other clear cuts (max. 2 ha) must be reforested within 2 years (Ministerium für Ernährung, Landwirtschaft und Forsten des Landes Nordrhein-Westfalen 1980).



Thuringia

The Free State of Thuringia is located in central Germany. The forest law of this state explicitly mentions coppicing. Firstly, in the context of clear cutting, the relevant article allows clear cuts in coppice and aged coppice forests, independent of their age. In all other broadleaved forests, clear cuts are not allowed until the age of 80 years. Secondly, in the context of the fee-based management services of governmental employees in private and community owned forest, the article states that fees for the management of coppice forest (excluding aged coppice and coppice-with-standards forests) are reduced by two thirds (Thüringen Forst 2015). These articles are supplemented by the state Strategy for the Conservation of Biodiversity (Thüringer Ministerium für Landwirtschaft, Forsten Umwelt und Naturschutz 2012). The strategy proposes the conservation of historical forest management types to reinforce specific forest structures and compositions.



Hesse

Hesse is in the centre of Germany. The Hessian Biodiversity Strategy does not mention coppice, coppice-with-standards or any other historical management systems (Hessisches Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz 2015). The state's forest law allows a maximum

clear cut size of 1 ha. Coppicing is explicitly mentioned in the context of clear cutting. The relevant article allows clear cuts in coppice and aged coppice forests, regardless of their age. In all other broadleaved forests, clear cuts are not allowed until the age of 80 years (Hessisches Ministerium für Umwelt, Energie, Landwirtschaft und Verbraucherschutz 2013).

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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

© 2018 Professur für Forstbenutzung, Albert-Ludwigs-Universität Freiburg, Freiburg i. Br., Germany

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)

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