



## FACTS AND FIGURES

Milun Krstić and Nenad Petrović

### Definitions

Coppice forest is a traditional silvicultural form that involves repetitive felling on the same stump, near to ground level, and allowing the shoots to regrow from that main stump or roots. Coppice forests in Serbia can be grouped into three categories based on their productivity: good productivity on a good site; low productivity on a good site; and low productivity on a bad site. Most common are productive coppice stands with valuable wood quality on a good site. The main silvicultural strategy in such coppice stands is indirect conversion towards high forest. Maximum rotation period is 80 years. Coppice is an important asset for private forest owners, especially for a regular supply of fuelwood from their small forest lots. The most abundant species are oak and beech.

*Izdanačke šume – panjače su su uzgojni oblik šume obnovljene vegetativnim putem, kada su se nova stabla razvila iz panjeva ili žila posečenih stabala. Izdanačke šume u Srbiji se mogu grupisati prema produktivnosti u sledeće kategorije: Dobre na dobrom staništu, loše na dobrom staništu i loše na lošem staništu. Najzastupljenije su dobre izdanačke šume na dobrom staništu. Glavna mera u toj kategoriji izdanačkih šuma je indirektna konverzija sa ciljem dobijanja visokih šuma. Maskimalna ophodnja u izdanačkim šumama je 80 godina. Izdanačke šume igraju važnu ulogu u redovnom snabdevanju privatnih šumovlasnika ogrevnim drvetom za sopstvene potrebe. Najzastupljenije vrste su hrast i bukva.*

Gajenje šuma – konverzija, melioracija i veštačko obnavljanje, 2006

### Legal Framework

There is no direct legal framework, but coppice is mentioned in the classification of forests in the Regulation of the Ministry of Agriculture, nr. 453/2006 (coppice and high forest originated from coppice). Coppice is a stand of deciduous trees with re-sprouting ability from roots and tree stools, predominantly in the oak forest vegetation zones.

**VÝMLADKOVÝ LES.** Výmladkový les tvoria listnaté porasty obnovované koreňovou a pňovou výmladnou schopnosťou, väčšinou v oblastiach dubového vegetačného stupňa.

#### In the Forest law, 2016:

1. Coppice forest is a stand of coppice origin that has not overgrown the size of a pole stand. In coppice forests, the marking of trees is not mandatory.
2. Short rotation coppice is only allowed on agricultural land.

### Statistics

Coppice stands occupy 1,456,400 ha, which is 64.7% of the total forest area. They are predominantly oak (42%) and beech (21%). Most coppice forests are in private ownership with 61.4%. The most common are preserved coppice stands with 76.3%. The share of insufficient stocked coppice stands is 21.3% over the area. Devastated coppice stands represent 2.4%. There is an unfavourable age structure: young (10%), middle-aged (78%) and mature (12%).

Source: National forest inventory of the Republic of Serbia, 2009

## Typology

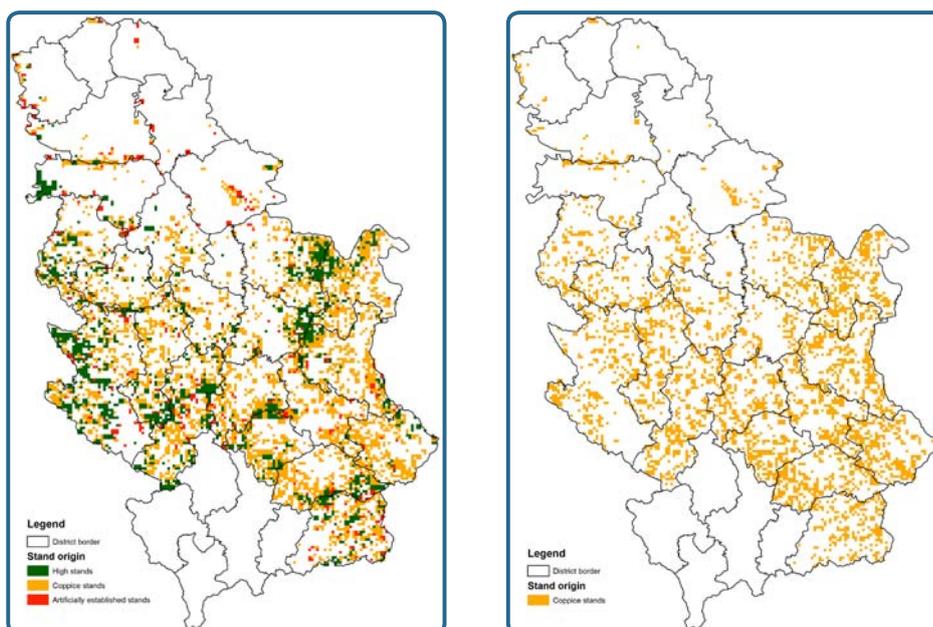
<b>Simple coppice</b>	Traditional natural regeneration methods
<b>Coppice with standards</b>	<i>Fagus</i> spp., <i>Quercus petraea</i> , <i>Q. cerris</i> , <i>Q. frainetto</i> , <i>Carpinus</i> spp.
<b>Pollarding</b>	Very rare
<b>Short rotation coppice</b>	<i>Salix</i> spp.
<b>Other types</b>	<p><u>False coppice</u>: <i>Fagus</i> spp., <i>Q. petraea</i>, <i>Q. cerris</i>, <i>Q. frainetto</i>; Very productive. This coppice type is scheduled by planning documents to be converted into high forests</p> <p><u>Preserved coppice</u>: Dense to complete canopy (1.0-0.6), good health and good-quality trees, there is a favourable ratio of principal and minor tree species.</p> <p><u>Insufficiently stocked coppice</u>: Incomplete canopy (0.4-0.6), good health and good-quality trees, but a less favourable ratio of principal and minor tree species.</p> <p><u>Devastated coppice</u>: Characterised either by broken canopy (below 0.4), or by poor tree health and quality, or completely unfavourable tree species ratio (favouring of minor species).</p>

## Images



## MAP

Nenad Petrović



Maps of coppice forests in Serbia (orange); compared to high forest (green) and artificially established stand (red) on the left and coppice on its own on the right (Data: National forest inventory of the Republic of Serbia, 2009)

## DESCRIPTION

Milun Krstić

The dominant form of silviculture in Serbia is coppice forests and they make up 1,456,400 ha, or 64.7% of the country's land area, and 50.0% of the forest volume. Most of the coppice forests, 61.4%, are in private ownership; 48% of those are dominated by oak and 25% by beech. The distribution of coppice forests by surface area is as follows: preserved coppice stands 76.3%, under-stocked coppice stands 21.3% and devastated coppice stands 2.4% (NFI 2009). Volume per hectare in preserved coppice forests is 133.0 m<sup>3</sup> ha<sup>-1</sup>; under-stocked 102.7 m<sup>3</sup> ha<sup>-1</sup>; devastated 42.5 m<sup>3</sup> ha<sup>-1</sup>. The age structure in the coppice forests is not favourable with the proportion of young, middle-aged and mature being 10:78:12. Coppice forests classified as energy coppice forests are not recorded as such in Serbia. Coppice forests produce a variety of products from small poles, used for fuel, to larger timber, etc.

The silvicultural methods used are those considered close to nature, in other words promoting permanently sustainable and economically justified activities, limited and conditioned by natural processes. Selection and application of suitable silvicultural or ameliorative methods depend on the precise degree of forest degradation (production, quality, condition, composition, origin, etc.) and the habitat and site conditions (the degree of degradation of soil, etc.), based on scientific criteria.

### References

- Aleksić P., Krstić M., Milić S., 2011. *Silvicultural needs and measures aimed the realization of the national forest action program of the Republic of Serbia*. First Serbian forestry congress – future with forest. Belgrade, Republic of Serbia, November 11-13. University of Belgrade, Faculty of Forestry, Belgrade. Congress Proceedings, pp. 87-96.
- Krstić M., Stojanović LJ., Rakonjac Lj., 2010. *The tasks of siculture in regard to the curent climate shange. International Scientific Conference "Forest ecosystems and climate changes"*. Institute of Forestry, Belgrade, March 9-10th, Plenary lectures, pp. 117-130.
- National Forest Inventory (NFI) – Presentation 2009, Belgrade (in Serbian).



Figure 1. A typical example of coppice in Serbia

Precise silvicultural measures appropriate for application to coppice are divided into the following basic groups:

- Quality coppice forests of valuable tree species and preserved habitat: *Indirect conversion* into high forest. Young stands are extensively cultivated in the respective stages of development; at maturity they shall be naturally regenerated. According to Forest Law, harvesting cannot take place before the trees are 80 years of age.
- Where forests have been degraded then *direct conversion* processes should be applied, with the land preserved and the degraded forests removed. Amelioration is carried out either by artificial restoration of the same species (restitution) or, where stands and habitats are degraded, planting of appropriate species of trees that can grow successfully under such conditions (substitution).

Where stands are unequally degraded over the site area then the amelioration procedures of indirect methods of conversion, restitution and substitution, can be combined.

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](http://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](http://www.eurocoppice.uni-freiburg.de)  
[eurocoppice@fob.uni-freiburg.de](mailto: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](http://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](http://www.freepik.com) (modified)

*Disclaimer: The views expressed in this publication are those of the authors and do not necessarily represent those of the COST Association or the Albert Ludwig University of Freiburg. Responsibility for content lies solely with the respective authors.*