

FACTS AND FIGURES

Tomislav Dubravac and Martina Đodan

Definitions

Coppice forests are the result of deliberate or undeliberate degradation of high forests and are of vegetative origin (sprouts from the stump or roots - Dubravac and Krejči, 2001). A common feature of most coppices is the absence of any silvicultural activities throughout their development (Krejči and Dubravac, 2004). Since they were left to spontaneous development, a whole spectrum of coppices formed, from those with the highest quality, a relatively high wood volume, good structure and crown coverage to those of poor quality and low wood volume. In the past, coppices resulted from the growing needs for fuelwood and the lack of proper managerial interventions. Today, they are mainly a result of the unsuccessful regeneration of high forests. Tree species forming coppices are oaks (sessile, pubescent, holm), beech, hornbeam, chestnut, alder, black locust, etc.

Panjače su šume niskog uzgojnog oblika nastale namjernim ili nenamjernim procesima degradacije sastojina visokog uzgojnog oblika. Zajedničko obilježje većine panjača je izostanak bilo kakvih uzgojnih radova u mladosti i tijekom njihova razvoja. Kako su prepuštene spontanom razvoju, formirao se čitav spektar, od onih najkvalitetnijih s relativno visokom drvnom masom dobro sklopljenih i suvislo obraslih sastojina pa do onih nekvalitetnih, razbijenog sklopa, s kržljivim i kvalitetno lošim stablima male drvene mase. U prošlosti su nastajale iz potreba za ogrjevom i nestručnim gospodarenjem, u novije vrijeme nastaju kao posljedica neuspjele obnove visokih šuma. Glavne su vrste drveća koje tvore šume niskoga uzgojnoga oblika kitnjak, medunac, cer, crnika, bukva, obični grab, kesten, joha, bagrem i dr.

Dubravac, T., Krejči, V. (2001) *Pojavnost mladog naraštaja u sačuvanim panjačama hrasta crnike (Quercus ilex L.) – uvjet osiguranja budućih sjemenjača. Occurrence of young crop in preserved coppice forests of evergreen oak (Quercus ilex L.) – condition for future seed forests.* Research Paper: Science in Sustainable Management of Croatian Forests, Faculty of Forestry, University of Zagreb, Forest Research Institute, „Croatian Forests“ Ltd. page 43-52, Zagreb

Krejči, V., Dubravac, T. (2004) *Oplodnom sječom od panjače do sjemenjače hrasta crnike (Quercus ilex L.). From coppice wood to high forest of evergreen oak (Quercus ilex L.) by shelterwood cutting.* Šumarski list (Journal of Forestry), Vol: 7/8, page 405-412.

Rotation Period

Rotation is determined by legal acts (Forest Management Rulebook).

Rotation for the coppice forests by species:

1. Oaks (*Quercus pubescens* Willd., *Quercus ilex* L., *Quercus petraea* (Matt.) Liebl.) - 80 years,
2. Beech (*Fagus sylvatica* L.) - 80 years,
3. European hornbeam (*Carpinus betulus* L.) - 40 years
4. Black locust (*Robinia pseudoacacia* L.) - 30 years
5. Soft deciduous (*Populus* sp., *Salix* sp., *Alnus* sp.) - 30 years.

Statistics

The area of coppice forests in Croatia amounts to 359,610 ha (14.4 % of forests in Croatia), while 192,986 ha (53.7 %) are managed by the state-owned company „Hrvatske šume“ Ltd., 5,832 ha (1.6 %) of state-owned coppices are managed by other legal entities and 160,792 ha (44.7 %) are privately owned. The total growing stock of coppice forests is approximately 41.1 million m³, with an annual increment of 1.09 million m³ (Source: National Forest Management Plan 2016 – 2025).

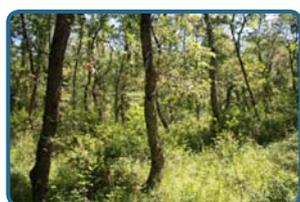
Area of state owned coppices according to tree species: *Fagus sylvatica* L. (103,737 ha, 28.9 %), *Quercus pubescens* Willd. (95,640 ha, 26.7 %), *Quercus cerris* L. (41,845 ha, 11.7 %), *Carpinus betulus* L. (28,786 ha, 8.0 %), *Quercus petraea* (Matt.) Liebl. (22,959 ha, 6.4 %), *Quercus ilex* L. (21,217 ha, 5.9 %), other tree species (44,620 ha, 12.4 %).

Area of private coppices according to tree species: *Quercus ilex* L. (65,679 ha, 23.9%), *Quercus pubescens* Willd. (60,424 ha, 22.0%), *Carpinus betulus* L. (46,873 ha, 17.1 %), *Fagus sylvatica* L. (26,356 ha, 9.6%), *Quercus petraea* (Matt.) Liebl. (15,342 ha, 5.6%), other tree species (59,993 ha, 21.8%).

Typology

| | |
|-------------------------------|---|
| Simple coppice | The most common type in the country. |
| Coppice with standards | Ca. 15% of coppices can be regarded as coppices with standards. |
| Pollarding | Found in the northern part of Croatia, Istria and especially in the northern part of the island of Cres (oak and chestnut, but also suitable for: Mediterranean oaks, chestnut, mulberry, hazelnut, willows). |
| Short rotation coppice | <i>Populus</i> sp., <i>Salix</i> sp. |

Images



Coppice forests in the northern part of Adriatic coastal area in Croatia. From left to right: holm oak coppice, pubescent oak coppice, Turkey oak coppice, holm oak coppice (photos Tomislav Dubravac)

DESCRIPTION

Tomislav Dubravac and Damir Barčić

The total area of coppice forest in Croatia amounts to 359,610 ha, of which 6.4% has a protective function, for example for soil and watercourses, and serves as a designated protected area (e.g. national parks) or another special purpose areas. Coppice forests in Croatia represent a significant source of wood products

and provide a variety of forest services and functions. There is an almost equal distribution between private and state ownership, at 55.3 % and 44.7 % respectively.

Generally, coppice forests in Croatia can be divided into the Continental and Mediterranean parts of the country. Characteristic tree species

in the Continental part are: European beech, hornbeam, sessile oak, chestnut, alder and black locust, while in the Mediterranean area one finds holm oak, pubescent oak and hornbeam.

Coppicing is the most convenient form of management for owners of small deciduous forests as it allows them to extract firewood, poles, small-sized industrial wood and fallen leaves. It is also possible to organize grazing in these coppices.



Figure 1. View of the holm oak coppice forest on the Croatian Adriatic coast (Photo: D. Barcic).

Coppices were created by intention or accidentally, curtailing the development of a single-stemmed standard tree.

It should be mentioned that degraded coppice stands often have a high habitat value. Conversion of coppice must retain the existing soil fertility, in addition to developing native stands from seed. In accordance with the Forest Act, which applies to all regular forests, including coppice stools, the aim of regeneration must be to produce a high forest stand. Exceptions to this are alder, poplar, willow and black locust stands, which can be renewed by clear cutting, reforestation and shoots.

As with the high forests, silvicultural activities in coppice are divided into two basic groups:

1. Silvicultural activities on the clearing and thinning of coppice.
2. Silvicultural activities on the regeneration of coppice.

Coppice forests in Croatia by categories of European forest types:

- 4 – Acidophilous oak and oak-birch forest;
- 5 – Mesophytic deciduous forest;
- 6 – Beech forest;
- 7 – Mountainous beech forest;
- 8 – Thermophilous deciduous forest;
- 9 – Broadleaved evergreen forest;
- 12 – Floodplain forest.

See Figure 2 for the distribution of these types by area.

Coppice rotation for species according to the Forest Management Plan regulations:

| | |
|---|----------|
| Oaks..... | 80 years |
| <i>(Quercus pubescens, Q. ilex, Q. petraea)</i> | |
| Beech..... | 80 years |
| <i>(Fagus sylvatica)</i> | |
| European hornbeam..... | 40 years |
| <i>(Carpinus betulus)</i> | |
| False acacia..... | 30 years |
| <i>(Robinia pseudoacacia)</i> | |
| Soft deciduous..... | 30 years |
| <i>(Populus spp., Salix spp., Alnus spp.)</i> | |

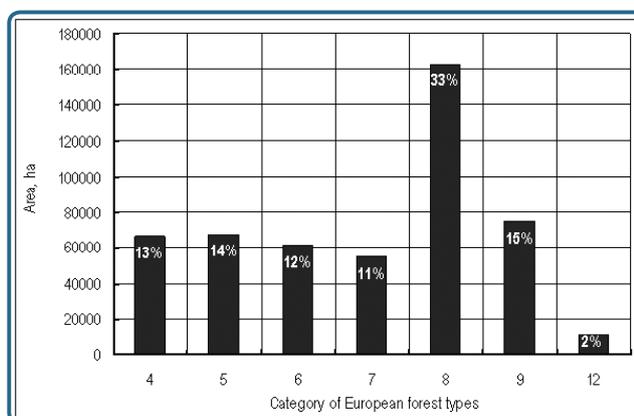


Figure 2. Area of coppice forests in Croatia by European forest types (Source: Dekanić et al, 2009)

FORESTRY REGULATIONS

Miljenko Županić

The tradition of forestry and organized sustainable forest management in Croatia is more than 250-years old. Most of the forest in Croatia is in state ownership (76 %) and it has always been regulated at the national level.

At present, forest management and other forestry activities are regulated by several **laws and legal acts**, such as the:

- Law on Forests
- Forest Management Rulebook
- Laws on Physical Planning & Building
- Nature Protection
- Forest Planting Material
- Law on Fire Protection

In the actual management of state forests, the state-owned company **Croatian Forest Ltd.** (in Croatian, Hrvatske šume d.o.o.) has a key role. The company is obliged by Law to make detailed **Forest Management Plans** and to keep precise book-keeping records of growing stock for every **Forest Management Unit**.

Coppice is mentioned only in forest management plans or the management plans of protected areas.

All forest areas in Croatia are split into management units, which usually cover 2000-3000 ha and are divided according to ownership (state or private). Forest management plans are made for each unit for 10 years. State units have had these plans for 50 years, while around 70% of private units are covered in practice by the **Advisory service** (state agency) plans. This agency is also responsible for the administration of private forests. Forest management plans are made by licensed companies, during which all stakeholders are invited to share their opinions. Private owners may also have an input into management rules that form part

of the plan (including coppice management), because these rules underlie applications for various projects and subsidies. Private owners who own more than 20 ha of forest can have a single ownership management plan. Each forest management plan must be approved by the Ministry, which may involve public discussion during the process of approval.

Currently, the most important policy document affecting coppice management is the **Law on Forests**, which is a national level regulation. Coppice is only mentioned as a silvicultural form in subordinate regulations – the **Forest Management Rulebook**; rotation periods are defined according to the management goals. These regulations incorporate EU timber regulations and Pan-European criteria and indicators for sustainable forest management.

According to these regulations, private owners must have permission to cut all types of forest, including coppice. Permission for cutting is given by the forest extension service on the basis that tree marking is done by a forester from a licensed company and proof of ownership is given to the court. If owners have to transport the wood products on public roads after cutting, they must obtain special delivery authorization, also issued by a licensed company, even if the owner uses the wood themselves. All of these administrative procedures have some financial cost, so most new owners who don't need wood for themselves are not interested in cutting, as profits are not guaranteed.

For private forests that are included in protection areas, subsidies may be available to compensate limitations in management, but only when managed according to the protection rules included in the management plan.

The main challenges in private forests are their small scale, the heterogeneity of silvicultural forms, poor cadastre and land-registry records, indistinct parcel borders and degradation of

forests (Čavlovic, 2004). However, the property rights as such remain the most important challenge, because this presents an obstacle to the consolidation of smaller properties.

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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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