



## FACTS AND FIGURES

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### Definitions

Forestry Act 2011: 88. (1) Forests are managed as high forest, conversion forest or coppice (Niederwald). (2) High forests are managed in a way to maintain their seedling origin. (3) Conversion forests are managed in a way that transforms them into high forest. (4) Niederwald is managed in a way ensuring its regeneration from re-sprouting.... (5) Not managed as forests are: ... 2. plantations of tree or shrub species for fast production of biomass;

§ 1. In the text of this Act: 54. “Niederwald” are forests of black locust (*Robinia pseudoacacia*), oriental hornbeam (*Carpinus orientalis*), manna ash (*Fraxinus ornus*) and honey locust (*Gleditsia triacanthos*) for coppice regeneration.

Forestry Act 2011, last changed in 7.08.2015

Чл. 88. (1) Горите се стопанисват като високостеблени, издънкови за превръщане в семенни и нискостеблени. (2) Високостеблените гори се стопанисват по начин, запазващ семенния им произход. (3) Издънковите за превръщане в семенни гори се стопанисват по начин, осигуряващ превръщането им в семенни. (4) Нискостеблените гори се стопанисват по начин, осигуряващ издънковото им възобновяване. (5) Не се стопанисват като гора: 2. плантации от дървесни или храстови видове, създадени с целускорено производство на биомаса;

§ 1. По смисъла на този закон: 54. “Нискостеблени” са акациевите, келяв габъррови, мъждрянови и гледичиеви гори за издънково възобновяване. Чл. 104. (1) Забранява се: 1. провеждането на гола сеч във всички гори с изключение на тополовите, върбовите и нискостеблените гори;

### Legal Framework

103. (1) ... Niederwald can be cut from Sept. 1<sup>st</sup> to Apr. 1<sup>st</sup>.

104. (1) It is prohibited: 1. to clear-cut a forest except poplar forests, willow forests and Niederwald.

### Rotation Period

102. The age of regeneration cut can be not less than ... 2. 50 years for a conversion forest; 3. 15 years for a black locust forest and 20 for the other Niederwald species.

### Statistics

Total forest area in Bulgaria is 3,833,640 ha. Conversion coppice takes up 1,351,815 ha, consisting mostly of oak (*Quercus* spp.; 1,025,571 ha), beech (*Fagus* spp.), hornbeam and linden (*Tilia* spp.). Conversion coppices have growing stock of 158,050,412 m<sup>3</sup>.

Coppice forests take up 481,747 ha, mostly with oriental hornbeam (197,909 ha) and black locust (153,851 ha) and have stock of 18,665,335 m<sup>3</sup>. Coppices mainly consist of trees older than 60 years.

## Typology

<b>Simple coppice</b>	Only black locust plantations are still coppiced, rotation age 20 years. Oriental hornbeam can also be coppiced, but this is seldom done.
<b>Coppice with standards</b>	Not practised
<b>Pollarding</b>	Abandoned since the post-war years
<b>Short rotation coppice</b>	Not practised
<b>Other types</b>	1,351,815 ha (in 2015) of conversion coppice, of which 70% is oak and 15% beech, as well as hornbeam, linden etc. Rotation age is 60 to 100 years, aimed at seedling regeneration; most are ageing; the average age is 45 years.

## Images



Oriental hornbeam coppice



Beech coppice



Oak coppice

## DESCRIPTION

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Bulgarian coppice occupies 1,833,562 ha, or 48% of the country's forest area. Oaks are dominant (60% of the coppiced area), mainly sessile oak, Hungarian oak and Turkey oak (*Q. petraea*, *Q. frainetto* and *Q. cerris*), followed by beech (10%), black locust (9%), oriental hornbeam (8%), hornbeam (*Carpinus betulus*; 6%) and smaller areas of linden (*Tilia* spp.), aspen (*Populus* spp.), chestnut (*Castanea sativa*), pubescent oak (*Q. pubescens*), pedunculate oak (*Q. robur* L.), etc. Single trees and groves of the pedunculate oak have survived in cornfields.

Bulgarian coppices are the result of thousands of years of human pressure; uprooting for cornfields and pasture, in addition to the extraction of timber, charcoal and firewood. The number of coppicing rotations is irregular and not

usually known, which makes it difficult to estimate their age and the vitality of their roots. With some species, a large spacing between the stems in a stool betrays a very old root system. Furthermore, all Bulgarian coppices have a large or small component of regeneration by seed; this improves their vitality but makes it even more difficult to evaluate their age.

Coppice is mainly found in the oak forest belt, the most densely populated part of the country. The average altitude is 450 m above sea level, rarely above 1000 m. Coppice forests are made up of 70% oak and 14% beech. One third (29%) are not owned by the state, of which half are private (14%) and the rest community owned. The average slope of the coppice sites is 19°, which is indicative of their protective function.

The average Martonne aridity index for Bulgarian coppices is about 30. By 2050 some 9–10% of them will have developed a steppe climate (aridity below 20) and will be gradually replaced by grasslands and shrubs. By 2080, depending on the climate change scenario, some 16% to 44% of them are expected to be lost in this way. Climatic change is perceived in Bulgaria as increasingly frequent snowless winters and summer droughts. Indirect evidence of this is given by the presence of exotic insects that were previously found only in the Mediterranean.

As a result of their abundance, Bulgarian coppice forests have never been subject to nature protection as such. However, in recent times over 60% of Bulgarian forests have been taken into Natura 2000 zones and habitats, including the bulk of the coppices.

Most of the coppice (74%) is in the process of conversion to high forest, with the remaining 26% maintained as simple coppice. Half of the simple forests are plantations of black locust, which are actually coppiced, the rest are natural stands of oriental hornbeam, which have been rather abandoned after decades of efforts to replace them with conifers. There are no coppice with standards areas in Bulgaria. In 1951 there were still 36,000 ha of pollarded high coppices, but since then pollarding has been abandoned. There is no short rotation coppice yet. Unlike Mediterranean countries, there is no *maquis* in Bulgaria. Deforested and devastated lands were afforested in the post-war years with nearly 1,000,000 ha of pine plantations, through which mountain streams and soil erosion were brought under control.

The rotation ages for the conversion forests are: 100 years for the best (site index I and II), 80 for the middle (III) and 60 for the poor (IV and V). Lower rotation ages are set for Turkey oak, with 60, 40 and 40 years, respectively. The average age of conversion forests is 45 years,

i.e. they are already aging. The rotation age for black locust is 20, its average age being 16. It is difficult to set a rotation age for the oriental hornbeam, but its average age is 50 years.

There are two types of coppice conversion to high forest in Bulgaria: poor coppices are clear-cut and replaced with conifers, mainly pines, or the final cutting is postponed until the reproductive power of stools diminishes and in the meantime they are thinned for pit-poles and firewood. The replacement with conifers was, however, abandoned in 2006 because the suppression of stools is too expensive.

In Bulgaria, the conversion of coppice to high forest is a policy dating back to the 1950s, but the main efforts started in the early 60s. This policy aimed to improve both productivity and quality of forests. Indeed, although coppices occupy 50% of the woodland, they produce only 39% of the harvested wood, mainly industrial wood and firewood. Sawlogs only make up 5% of the harvested wood, against 23% for the broad-leaved high forest and 36% for the conifers. Nowadays, the rising prices of energy wood gives some cause to reconsider this policy. Although the firewood prices are also rising in Bulgaria, it is nevertheless the cheapest form of energy. All rural areas in Bulgaria use firewood for heating.

If biomass production is the aim of Bulgarian coppice management, an examination of mean increment shows that the optimal rotation time is about 20 years. At that age, the stands do not produce seeds and should regenerate by re-sprouting. However, resuming coppicing will be a silvicultural challenge because of aging and problems with oak regeneration. Recently, private forest owners often clear-cut their coppice, counting on regeneration by re-sprouting, but the aged coppice re-sprout badly. In addition, Bulgarian coppice forests are dominated by oak, which has a poorer regen-

eration because it does not produce suckers (shoots from the roots), unlike beech and the other coppiced species. Another problem is the aging of the root system, which is older than the stems in a coppice. After a number of coppice rotations, the tap root of the oak begins to decay. Thus, the oak coppices become unstable, shallow-rooted forests. In the lowland, their disappearance is a question of time; a large part of the oak coppices are currently in this threatened condition, especially the Turkey oak. The sustained management of such forests requires making use of the available natural seedlings

to renew the root system. Most suitable is the group shelterwood method of cutting with a regeneration period of 15 to 20 years. Where natural regeneration with seedlings is impossible, or has failed, acorns must be sown - in the autumn and after soil preparation, in order to reduce the competing vegetation. Planting of saplings should be avoided because oak develops a deep root while growing in the nursery, which is damaged by transplanting. In conclusion: although the idea to resume coppicing is very promising, it requires further investigation and experiments.

## References

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## FORESTRY REGULATIONS

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Bulgarian coppice forests cover an area of almost 2,000,000 ha, or 48% of the total forest area. There are no plans for their protection; however, an large percentage of these coppices is protected under the Natura 2000 network, a network which covers 60% of Bulgarian forests. Most coppice is state-owned (ca. 70%) or municipal (15%); privately owned coppice is characterised by very small plots belonging to millions of owners.

### The main regulations affecting coppices are:

- Forestry Act + Implementation Rules
- Forest Management Ordinance
- Ordinance on Felling

They can all be downloaded from the website of the Executive Forest Agency.

### Forestry Act

The act was issued in 2011 and amended many times afterwards. It has the following texts that affect coppice:

**Art. 13.** (1) Forest management plans shall be elaborated for state forests and municipal forests, with the exception of the territories provided for the needs of the national security and defense. ... (3) Forest management plans or programs are developed for the forests owned by natural persons, legal entities and their associations. ... (4) The forestry plans and programs shall determine the permitted use of the forest resources and the guidelines for achieving the management goals of the forest territories for a period of 10 years.

**Art. 88.** (1) The forests shall be managed as high forest, coppice for conversion into high forest or coppice (Niederwald). ... (5): ... 2. Plantations of wood or shrub species created for the purpose of accelerated production of biomass are not considered to be forests.

**Art. 102.** Final cuts shall be carried out at an age of not less than: ... 2. 50 years in the coppice forests for transformation into high forest; 3. 15 years for black locust plantations and 20 years for the other coppice forests.

**Art. 104.** (1): 1. Clearcuts are prohibited in all forests except for poplar, willow and low-stem (coppice) forests.

**Art. 124.** 3. Grazing is prohibited in forest plantations, young forest stands regenerated by seed and coppice until they reach a height of 3 m;

§ 1. ... 9. “Clearcut” is a final cut where, for a period of not more than one year, all the trees of the mature stand on a given territory are cut. ... 54. “coppices” are forests of black locust, oriental hornbeam, manna ash and honey locust regenerated by shoots.

### **(Forestry Act) Implementation Rules**

The Implementation Rules state the following usages:

**Art. 89.** ... (3) The use of wood after paying the stumpage price ... may be effected in: ... 4. cutting of coppice forests for conversion into high forest and coppice forests maintained as coppices.

### **References**

Forestry Act and Implementation Rules (Закон за горите). Executive Forests Agency: <http://www.iag.bg/docs/lang/1/cat/1/index>

Forest Management Ordinance. Executive Forests Agency: <http://www.iag.bg/docs/lang/1/cat/1/index>

Ordinance on Felling. Executive Forests Agency: <http://www.iag.bg/docs/lang/1/cat/1/index>

**Art. 109.** The number of animals grazing in forests shall be determined according to productivity and conditions of the pastures and the grass cover, in compliance with the following limitations: ... 2. for coppices: up to 1 cow per hectare and up to 1 sheep or pig per 0.2 hectares.

### **Ordinance on Felling**

The Ordinance on Felling gives many details on conversion.

### **Forest Management Ordinance**

The Forest Management Ordinance regulates the elaboration of forest management plans and programs (a program is a simplified plan made for a small property). It provides details on rotation age in managed forests (covered by management plans), while the minimal cutting ages specified above are valid in all forests. The common rotation ages for the high forest conversions are: 100 years for the best (site index I and II), 80 for the middle (III) and 60 for the poor (IV and V). Lower rotation ages are set for Turkey oak, 60, 40 and 40 years, respectively. The rotation age for black locust is 20 years.

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