



## FACTS AND FIGURES

Valeriu-Norocel Nicolescu

### Definitions

(1) Coppicing (regeneration method) is the general way of managing a forest, based on vegetative propagation (Forest Law, 2015).

(2) Simple coppice (low coppice) - silvicultural system in which the old stand is exploited at young ages (under 30-40 years) by clear-felling, and the regeneration is accomplished by stump stools or root suckers.

(3) Pollarding - cuts by which the tree trunks are shortened at 2-3 m height from the ground, to avoid the death by asphyxiation of the cut trees during flooding.

(4) Coppice with standards - intermediate regeneration method, between the two fundamental ones (coppice and high forest), in which the regeneration is accomplished by both seed and stools.

*(1) Regimul crângului constituie modul general de gospodărire a unei păduri, bazat pe regenerarea vegetativă (Codul Silvic, 2015).*

*(2) Crâng simplu - tratament prin care arboretul se recoltează la vârste tinere (sub 30-40 ani) printr-o tăiere rasă, iar regenerarea se face prin lăstari sau drajoni.*

*(3) Crâng cu tăiere în scaun - tăieri prin care tulpinile arborilor se scurtează de la înălțimea de 2-3 m de la sol, pentru a feri suprafețele tăiate de asfixie în timpul inundațiilor.*

*(4) Crâng compus - regim intermediar între cele două regime fundamentale (crâng și codru), în care regenerarea se face atât din sămânță, cât și din lăstari.*

### Legal Framework

In all Romanian forests, the only legal regeneration method (regime) is high forest.

The only forests in which coppicing is allowed consist of native poplars (black and white), willows, black locust, as well as alluvial forests (pure or mixed willow and/or poplar stands) (Forest Law, 2015).

### Rotation Period

Black locust stands: from 20 years (5<sup>th</sup> yield class) to 35 years (1<sup>st</sup> yield class);

White willow: from 15 years (5<sup>th</sup> yield class) to 30 years (1<sup>st</sup> yield class)

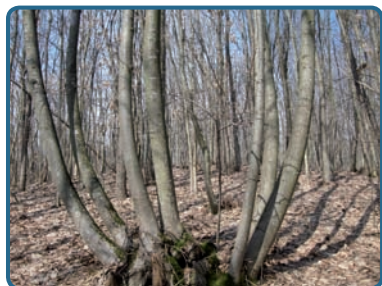
### Statistics

Coppice (low) forests cover only about 5% of national forestland.

## Typology

<b>Simple coppice</b>	Legally performed only in black locust, native poplars (black and white) and native willow stands; size of logging areas: maximum 3 ha
<b>Coppice with standards</b>	Forbidden since 1948
<b>Pollarding</b>	Performed in white willow ( <i>Salix alba</i> ) stands along the Danube and major inner rivers
<b>Short rotation coppice</b>	Practised on a small scale, only for willows and hybrid poplars

## Images



Low coppice, linden; since converted to high forest



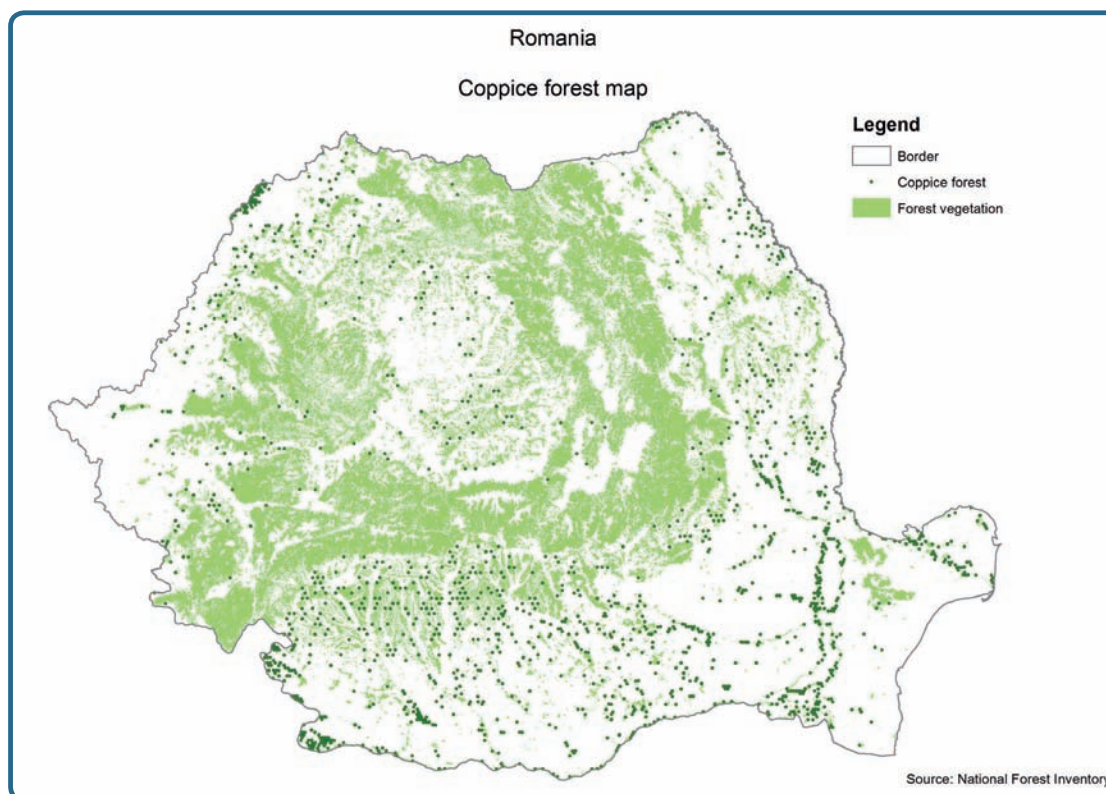
Pollarding



Willow clone treated as short rotation coppice

## MAP

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Map of coppice forest (dots) and forest vegetation (green) in Romania  
Source: National Forest Inventory of Romania, 2017

## DESCRIPTION

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Coppice forests have always been a major component of Romanian forest land as:

- the forests are historically dominated by broadleaved tree species, mainly oaks (e.g. sessile, pedunculate, Turkey, Hungarian, pubescent) and European beech, but also maples, ash, hornbeam, lindens, alders, poplars, willows, etc. Although their share has decreased in the past two millennia due to human transformations, broadleaves still cover over 70% of the national forest land.
- the country has one of the highest rural populations in Europe; this is still true despite its decrease from 89% in the mid-19<sup>th</sup> century to about 46% at present.

Before the nationalisation of all forests at the end of the Second World War and beginning of the Communist period, coppice forests covered important areas in Romania: 1.9 million ha (30% of forest land) of simple coppice in 1948 (Costea, 1989), over 0.229 million ha (3.5% of forest land) of coppice-with-standards in 1928 (Ionescu, 1930). In 1948, the application of coppice-with-standards was completely forbidden, with all coppice forests of this kind being converted towards high forests. Owing to the same process of conversion, the share of simple coppice in Romanian forests has continuously decreased so that they currently cover only 5% of national forest land. According to the current Forest Law (2015), the simple coppice system can be applied only to native poplars (i.e. black, white), willows in floodplain areas, and black locust forests. Yearly, approximately 3,500-4,500 ha of simple coppice stands are harvested in Romania ([www.insse.ro](http://www.insse.ro)); the maximum size of coppice areas is 3 ha.

The application of coppice forest management in Romania is also possible in the floodplain

willow forests, which are pollarded (high coppiced) with a rotation of (15) 20 to 30 (35) years when targeting the production of sawn timber. Logging areas in pollard stands are located perpendicular to the watercourses (Figure 1), with a size of maximum 10 ha. The rotation of cutting in pollarding is annual.

Since 2005, the application of short rotation coppice management has started in Romania exclusively on agricultural, non-forest land. Currently over 800 ha of willow cultures, as well as ca. 1,000 ha of poplar cultures have been established.

Coppice forests, mostly of black locust (the species covers over 250,000 ha) are a major supplier of firewood in many rural areas of Romania. They are also important for the protection of river banks (poplars and willows), on sandy soils (black locust), in the honey-related industry, etc.

Since about 800,000 ha of Romanian forests, consisting mostly of broadleaved tree species with a high potential for vegetation reproduction, are owned by over 700,000 small forest owners (average size of forest estate 1.1 ha), the management of such lands as high forests, which is mandatory according to the legal requirements, is a major challenge in technical



Figure 1. Pollards of white willow are a characteristic feature along the banks of Danube River.

and economic terms. Unfortunately, there is no political commitment for re-defining their economic/ecological targets and re-converting these forests into simple coppices or coppice-

with-standards, which would affect the ownership rights, as well as the freedom to manage them in a more dynamic and profitable way.

## References

Costea, C. 1989. *Economia și conducerea întreprinderilor forestiere*. Editura Ceres, București, 339 p.

Ionescu, A.I. 1930. *Contribuții la studiul culturii și tehnicii crângurilor compuse în România*. Revista pădurilor, no. 12, pp. 1256-1282.

[www.insse.ro/cms/files/Anuar%20statistic/14/14.Agricultura%20si%20silvicultura\\_ro.pdf](http://www.insse.ro/cms/files/Anuar%20statistic/14/14.Agricultura%20si%20silvicultura_ro.pdf)

2015. Codul silvic.

## FORESTRY REGULATIONS

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### Legal framework in relation to coppice

#### **1. Law no. 133/2015 for the modification of Law 46/2008 (Forest Law)**

Art. 28:

(2) The high forest regeneration system is applied to the regeneration of all forests.

(3) The exception from (2): stands of native poplars (black, white) and willow, in the floodplain areas, and black locust stands, where the application of a coppice regeneration system is allowed.

Art. 29:

(1) The size of clear-cutting (including coppice) coupes is a maximum of 3 ha.

**2. Ministry of Waters, Forests and Environmental Protection 2000: Technical norms for the choice and application of silvicultural systems 3** (*Norme tehnice privind alegerea și aplicarea tratamentelor 3*). Ministerul apelor, pădurilor și protecției mediului, București, 78 pp.

### Low coppice

Its application is only allowed in native poplars, willow stands in the floodplain areas and black locust stands.

Regeneration is by coppice stools or root suckers.

Cutting is only during the dormant season, preferably close to its end.

Size of coupes: max. 3 ha. Interval between the cuttings in the same compartment: 2-3 years.

Cutting with axes (tree diameters less than 15 cm) or a saw (larger diameters or stools originating from old stumps); maximum height of stump is 5 cm.

The variant with regeneration by root suckers, after the removal of stumps and levelling of the ground: not allowed in sites with mobile sand dunes and with erosion problems.

After 3-4 generations of coppice (by stump stools), the stumps are removed and replaced with plants to avoid the degradation of low coppices.

### Pollarding

The system is used for willow stands affected by repeated flooding, i.e. in the Danube Delta and Danube floodplain area.

Stumps are cut high, above the highest flooding levels over a long chronosequence, to avoid the stump being covered by the flood waters.

The old high stumps are removed after 2-3 generations of pollards and replaced by plantations with seedlings or rods (tall cuttings).

Size of annual coupes: 10 ha. Rotation of cuttings in the same compartment: 1 year.

Arrangement of coupes: perpendicular to the watercourse.

### Coppice selection system

Can be adopted experimentally in some small-sized black locust stands, in stands located on ravine banks or on degraded lands.

Can be taken into account in small-sized private forests.

Note: even though it's part of the technical norms, this system is NOT included into the table used to choose the silvicultural systems for different forest vegetation formations/types!

### **3. Ministry of Waters, Forests and Environmental Protection 2000: Technical norms for forest management 5** (*Norme tehnice pentru amenajarea padurilor*).

Ministerul apelor, padurilor si protectiei mediului, Bucuresti, 163 pp.

They include:

(i) Calculation of annual allowable cut for management units treated as coppice: for black locust stands (10-year period), as well as native poplar (black, white) and willow stands (5-year period).

(ii) 10-year management plans for:

- exploitable coppice stands, reaching the rotation age (coppice cuttings)

- non-exploitable or pre-exploitable coppice stands, with tending operations
- coppice stands to regenerate artificially.

(iii) Rules for converting coppice forests to high forests:

- conversion by coppice ageing (total cessation of coppice cuttings)
- conversion by coppice replacement and planting

(iv) Technical rotation age in stands/compartments treated as coppice, depending on the species and yield class:

Species	Technical rotation age per yield class...				
	I	II	III	IV	V
<b>Black locust</b>	35	30	25	25	20
<b>Native poplars (black, white)</b>	35	35	30	25	25
<b>Willow (pollard)</b>	30	25	20	20	15

(v) Intensity of thinning (% of standing volume) in coppice stands with canopy cover 90-100%, depending on the species and mean stand age:

Species	Mean stand age (years)	
	11 - 20	21 - 30
<b>Black locust</b>	35	35
<b>Native poplars (black, white)</b>	30	25

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