COST Action FP1301 EuroCoppice
Training School: "Coppice Management, Biodiversity and Services"
17.07.2016 – 23.07.2016
Boppard, Germany

Hosted by: Albert-Ludwigs-University of Freiburg
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Preparatory "Mini-posters"

COPPICE FORESTS IN BANGLADESH

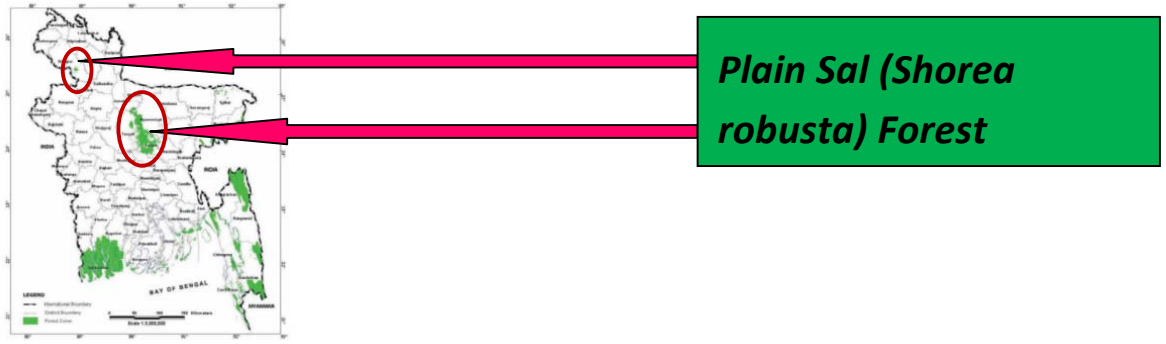
TRANSLATION & DEFINITION

"Coppice forest" in Bangla:	**ঝাড় বন** (Jhar Ban)
Definition of "Coppice forest":	Sprouting ability of tree may contribute to rapid restoration of forest cover in the gaps after timber extraction or cyclone damage[1].

STATISTICS

Total forest area:	2.53 Mha 17.5 % of country area[2]
Distribution of forest area in:	26.5% Evergreen 29% Mangrove 4.7% Deciduous 10.7% Village 29% Unclassed State[3]
Forest ownership:	89.2% Public 10.7% Private[3]
Traditional coppice forest area:	0.12 Mha 4.7% of forest area[4]
Main coppice species:	*Shorea robusta*[5] *Gmelina arborea*[6] *Tectona grandis*[6]
Main coppice products:	Fuel-wood, fodder, timber, poles, furnitures & construction materials[7].

DISTRIBUTION – MAP[8]



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PICTURE OF A TYPICAL COPPICE FOREST STAND[9]

EXPLANATORY TEXT

Plain Sal forests are tropical moist deciduous forests, consist of patches of Sal coppices. They are generally categorized as Pure Sal forests and Mixed Sal forests based on soil characteristics and tree canopy. Pure Sal forests grow on shallow, dry and less productive soils, and these forests exist only in coppice form with sparse understory and relatively very few species. While Mixed Sal forests grow on productive soil with complex understory of different deciduous and evergreen species[10]. Over exploitation, conversion of the forestland into agriculture, forest fire, and over grazing has reduced the productivity of the forest an alarmingly low level[11]. Some estimates revealed that 65% of the Sal forest area is either highly degraded or encroached upon[12].

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COPPICE FORESTS IN CHINA

TRANSLATION & DEFINITION

"COPPICE FOREST"	萌生林 （MENG SHENG LIN）
Definition of "Coppice forest":	forest regrows from chopped trunk base and harvested regularly[1]

STATISTICS

Total forest area:	207 million ha	21.63 % of country area [2]
Distribution of forest area in:	21 % Conifer	18 % Broadleaf and mixed forest [1]
Forest ownership:	60.8 % Public	collective: 15% 23.5 % Private [1]
Traditional coppice forest area:	2 million ha	1 % of forest area [1]
Short rotation coppice area:	16 million ha	8 % of forest area [1]
Main coppice species:	Giedisia genus, salix genus, Abies genus, Quercus genus, Paulownia genus, Betula pubescens, Pinus resinosa, Eucalyptus, Mesua ferrea	
Main coppice products:	handcraft (basket, etc), firewood, tanning extracts, paper, domestic fungus culture media, medicine [2]	

DISTRIBUTION – MAP [3]

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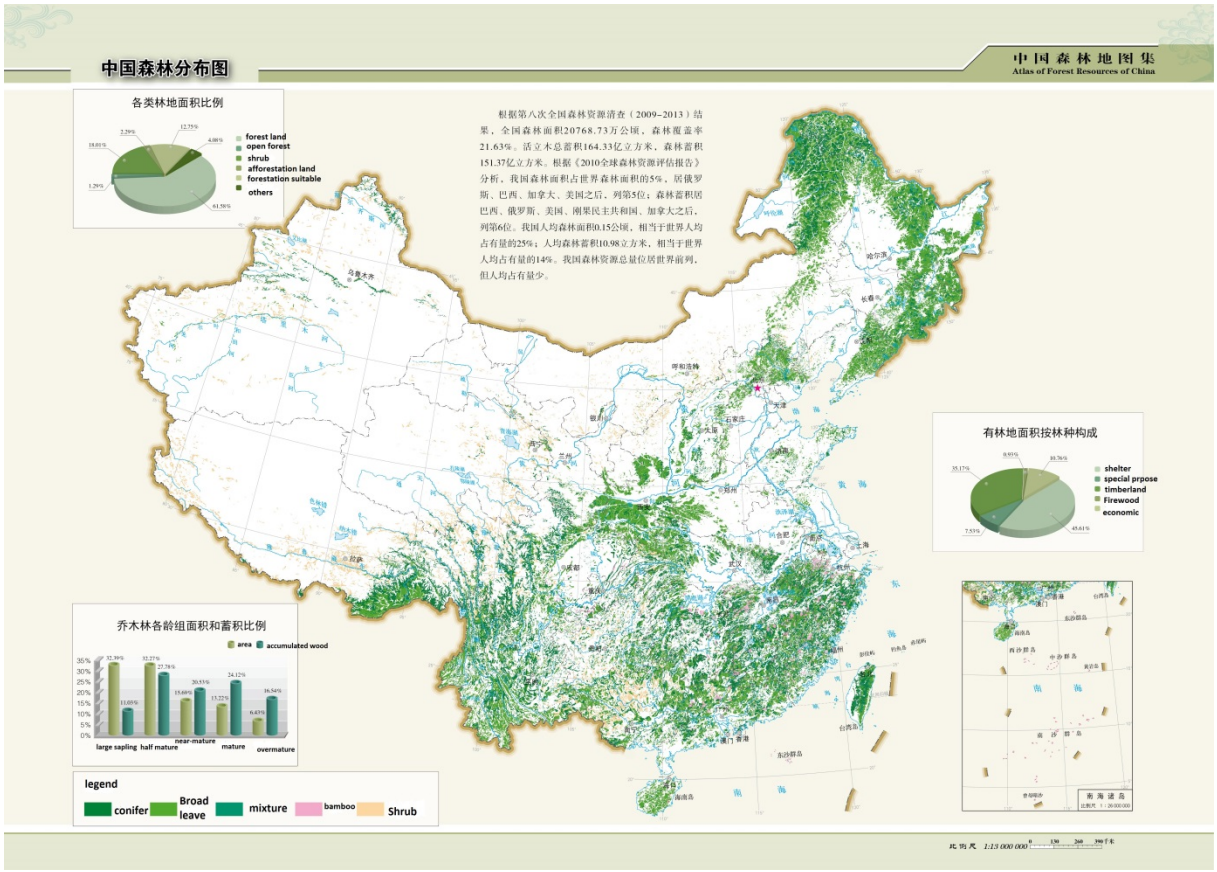

PICTURE OF A TYPICAL COPPICE FOREST STAND [4]

EXPLANATORY TEXT

There are no legal of coppice in China. Therefore, atlas does not have coppice data too. It is divided and accounted in sub-categories of economic forest include, firewood, food raw material, chemical forest, hedges. Majority forestland ownership is collective (60%) and 80% of it managed by private household.

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[3] Add reference here

[4] Add reference here

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COPPICE FORESTS IN CROATIA

TRANSLATION & DEFINITION

"Coppice forest" in Croatian:	Šume panjače
Definition of "Coppice forest":	Low forest that grows out of stamps or roots (Čavlović, 2010) [1]

STATISTICS

Total forest area:	2 580 000 ha	46 % of country area[1]
Distribution of forest area in:	7 % Conifer	62 % Broadleaf [1]
Forest ownership:	77 % Public	23 % Private [1]
Traditional coppice forest area:	925 410 ha	36 % of forest area [1]
Short rotation coppice area:	0 ha	0 % of forest area [2]
Main coppice species:	beech, oaks (Q.ilex, Q.pubescens, Q.petraea), hornbeam, black alder, black and locust, chestnut, fir [1]	
Main coppice products:	firewood (sticks, poles...) [1], fruits of chestnut and mushrooms [3]	

DISTRIBUTION – MAP [4] [3]

Picture 1. Map of the country, total forest distribution, forest ownership distribution and coppice forests distribution in Croatia

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PICTURE OF A TYPICAL COPPICE FOREST STAND [5]

Picture 2. Coppice forest stand of chestnut (*Castanea sativa,* left and middle) and holm oak (*Quercus ilex,* right)

EXPLANATORY TEXT [1]

Coppice forests area in Croatia responds to traditional coppices which are managed like a coppice. Traditional coppice management in privately owned forests was linked with rural areas with high density of population. Most of the private forests are individually owned and there are just few examples with group ownership. Biggest problem in privately owned forest are small scales and unsolved ownership. Owners can get advice from Advisory service which has forest advisors as employees in every county. In traditional rural areas in past ten years, a lot of private forest owners associations are established and most of them also own coppice. According to actual forest low private owners must have permission to cutting coppice as all other type of forest. In the policy context all wood industry are based on wood from high forest so there are no presence of specific coppice product using industry. General opinion from all experts is that the coppices are not as valuable as high forests. Coppice are not recognized as a big potential and should be converted into high forest whenever is possible (depending on stands quality), but this is not obligatory. Concerning the fact that most of the private forest owners are not interested in any type of management it is secure that current status of coppice will not be significantly changed in the future.

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TRADITIONAL COPPICE FORESTS IN CZECH REPUBLIC

TRANSLATION & DEFINITION

"Coppice forest" in Czech:	Nízký les = low forest
Definition of "Coppice forest":	Coppicing is based on the new growth in deciduous trees from the stump or roots if cut down periodically. [1]

STATISTICS

Total forest area:	2 751 587 ha	34.9 % of country area [2]
Distribution of forest area in:	67.2 % Conifer	32.8 % Broadleaf [2]
Forest ownership:	76. 8 % Public	23. 2 % Private [2]
Traditional coppice forest area:	71 012 ha	2.6 % of forest area [2]
Short rotation coppice area:	2 826 ha	0.11 % of forest area [3]
Main coppice species:	Sessile oak, hornbeam, black locust, lime, poplar [4]	
Main coppice products:	Firewood, biomass [4]	

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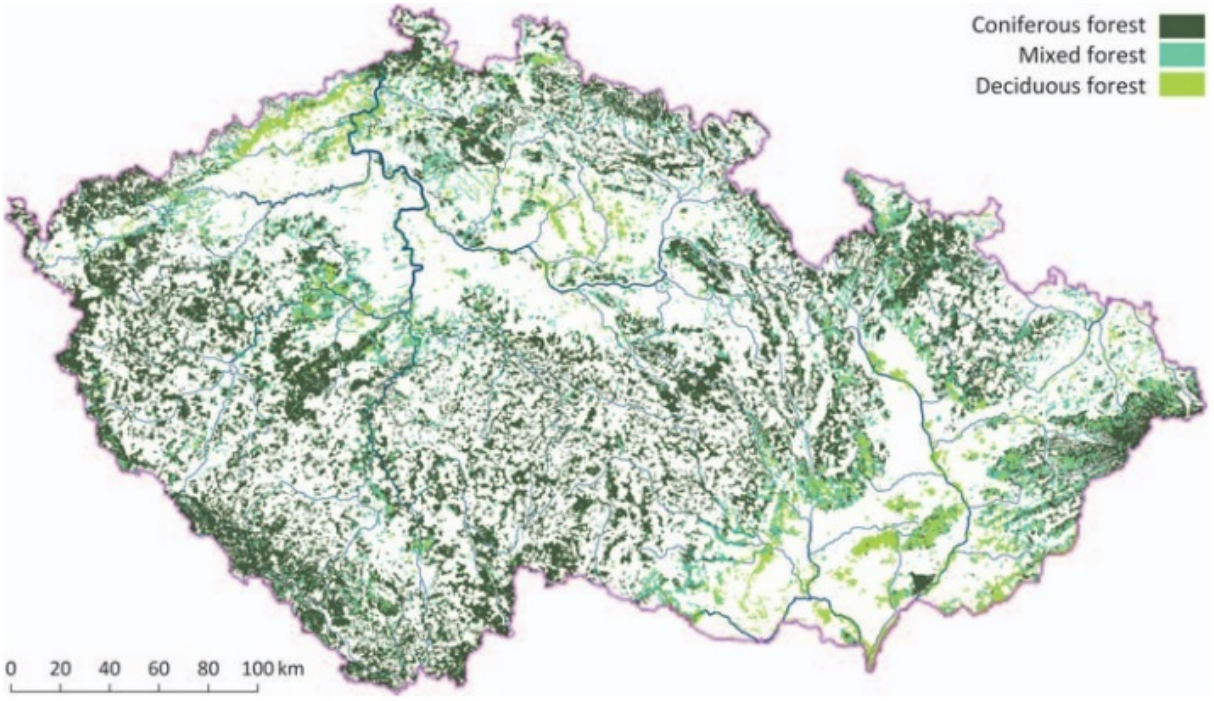
DISTRIBUTION – MAP [2]



Coppice forest patches are mostly situated in the areas dominated by deciduous species (marked in light green on the map).

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PICTURE OF A TYPICAL COPPICE FOREST STAND [7]

EXPLANATORY TEXT

At the beginning of 20th century coppices in Czech Republic were abandoned due to changes in market demands for coppice products[1]. Most of the coppice forests were converted to high forest [5], or stored coppices whose structure resembles that of high forest due to absence of coppicing cycles [6]. Nowadays, there is interest in restoration of coppices due to their high nature conservation value and production of renewable energy [4].

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COPPICE FORESTS IN CZECH REPUBLIC

TRANSLATION & DEFINITION

"Coppice forest" in Language: Nízký les or Výmladkový les or Pařeziny

Definition of "Coppice forest":	Coppicing is a type of traditional forest management where systematically repeated vegetative restoration (regenerated) shoots or root suckers. Economic shape of coppicing forest is very old; covering the need for firewood [1, 2].

STATISTICS

Total forest area:	2 751 587 ha, 34.9 % of country area [2]
Distribution of forest area in:	67.2 % Conifer, 32.8 % Broadleaf [2]
Forest ownership:	76.8% Public, 23.2% Private [2]
Traditional coppice forest area:	71012 ha, 2.6% of forest area [2]
Short rotation coppice area:	2826 ha, 0.11 % of forest area [3]
Main coppice species:	Sessile oak, hornbeam, black locust, lime, poplar, willow [2]
Main coppice products:	Firewood, biomass, energy [2]

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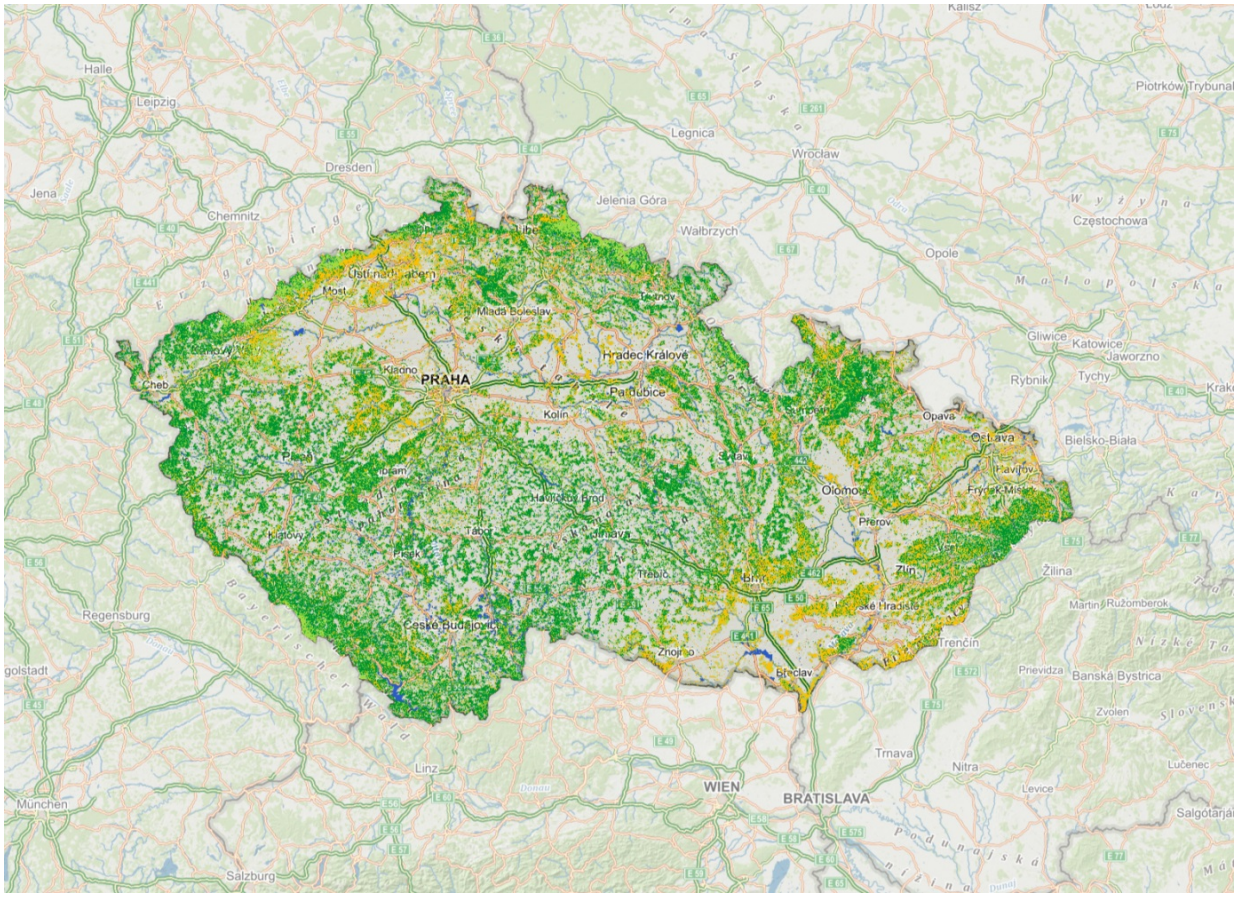
DISTRIBUTION – MAP [1]



Source - Výkladový slovník hospodářské úpravy lesů edited by Jan Krejza (Global Change Research Institute, Brno, Czech Republic)

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PICTURE OF A TYPICAL COPPICE FOREST STAND [2]

(a) Traditional coppice "as it was a frequent management practice in the past for e.g. willows (in the front) and modern coppice of a short rotation poplar plantation (in the background of the image.

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(Source:Rutz D.)" and (b) coppice management in poplar at Domaninek, Czech Republic (source: picture taken by Abhishek).

EXPLANATORY TEXT

Since 1900s about 155,000 ha Czech countryside is covered with low (coppicing) and medium deciduous forest consisting mainly of oak, hazel, linden, field maple, alder, hornbeam,poplars and willows (depends on appropriate climatic conditions), which are harvested approximately after each 7-30 years. Within the Czech Kingdom and the Moravian Margraviate, the authority of chief hunters covered both forest and forest management. In an effort to establish a controlled forest management a rotation period for harvesting in coppice forests was introduced. Czech forestry research and practice in recent years emphasize on coppice forest because of increasing demand on firewood and biomass[2, 4].

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COPPICE FORESTS IN ENGLAND

TRANSLATION & DEFINITION

"Coppice forest" in English:	Coppice woodland.
Definition of "Coppice forest":	Management based on regeneration by re-growth from cut stumps (coppice stools). The same stool is used through several cycles of cutting and re-growth.[1]

STATISTICS

Total forest area:	1096885 ha	8.4 % of country area[2]
Distribution of forest area in:	25.6 % Conifer	52.1 % Broadleaf [2]
Forest ownership:	22 % Public	78 % Private [2]
Traditional coppice forest area:	21853 ha	2.1 % of forest area [2]
Short rotation coppice area:	3000 ha	0.3 % of forest area [3]
Main coppice species:	*Castanea sativa, Corylus avellana*, *Acer campestre*, *Quercus petraea/ robur* and *Salix* spp. [4]	
Main coppice products:	Thatching, spars, hurdles, charcoal, firewood [5]	

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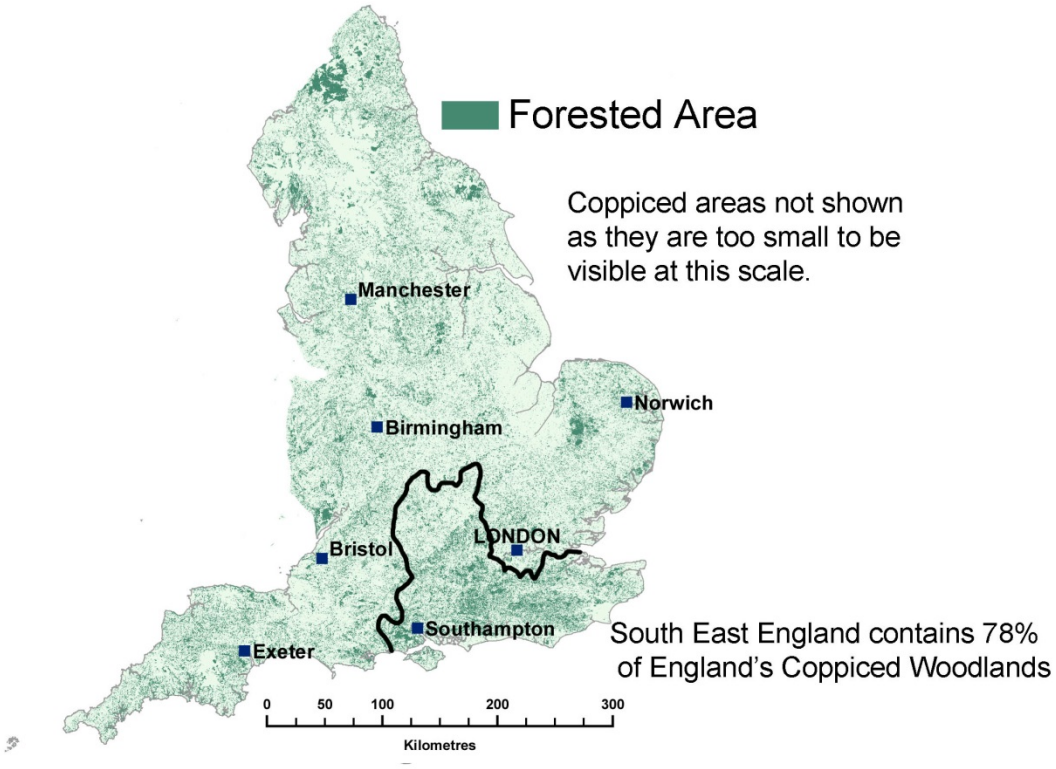
DISTRIBUTION – MAP [6]



PICTURE OF A TYPICAL COPPICE FOREST STAND [7]

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EXPLANATORY TEXT

Historically coppicing has been the most commonly used silvicultaral system for broadleafed woodlands in England.[5] The area of coppiced woodland has declined rapidly from 230, 000 Ha in 1905 to only 23,000 Ha in 1997.[8] The area of coppice has now stabilized with a slight increase in area due to restoration of old coppices.[8] In recent times there has been a heightened interest in coppicing, particularly for its ecological value and cultural heritage.[9]

Coppicing's economic importance is still however negligible, although there are expanding markets for firewood, charcoal and garden products.[5] There are currently approximately 1,100 people working in the coppice industry.[5] With the overwhelming majority of traditional coppiced woodlands situated in south east England.[2]

SRC (Short Rotation Coppice) is seen as having great potential for use as a biofuel using Miscanthus, willow and poplar and could play a significant part in helping the UK meet its renewable energy target of 15% .[10]

Although there has been a renewed interest in traditional coppicing and an increase in demand for sustainably sourced local products, the main future development of the market for coppice woodlands is most likely to lie with SRC.[5]

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COPPICE FORESTS IN GREECE

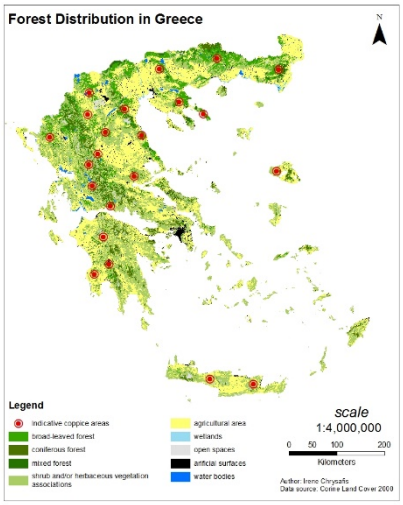
TRANSLATION & DEFINITION

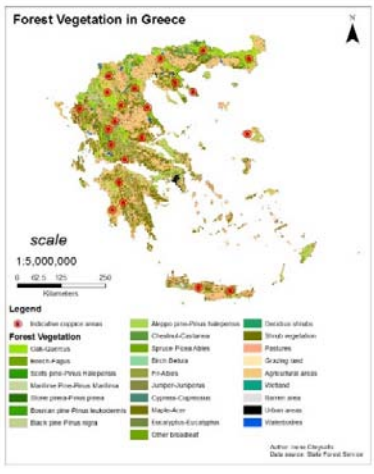
"Coppice forest" in Greek:	ΠΡΕΜΝΟΦΥΕΣ ή ΠΑΡΑΒΛΑΣΤΟΓΕΝΕΣ ΔΑΣΟΣ
Definition of "Coppice forest":	Forests that resprout after felling. And the regeneration is done by suckers[1]

STATISTICS

Total forest area:	3,359,000 ha	25.5 % of country area[2]
Distribution of forest area in:	42.57 % Conifer	57.43 % Broadleaf [3]
Forest ownership:	65.5 % Public	34.5 % Private [4]
Traditional coppice forest area:	2,193,000ha	65 % of forest area [5]
Short rotation coppice area:	13,227ha	0% of forest area[6]
Main coppice species:	oaks, chestnut, beech.[7]	
Main coppice products:	pulpwood, firewood, charcoal, stakes and poles [8]	

DISTRIBUTION – MAP [9]





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PICTURE OF A TYPICAL COPPICE FOREST STAND [10]

EXPLANATORY TEXT

Greece is a predominantly oak forest country. The majority of these oak forests (12 different species) are coppice managed[11]

Forests managed as coppice totally consist of even-aged stands[12] Rotation times applied usually vary 20–30 years[13].

The priorities of silviculture in Greece (concerning coppicing) are:[14]

- The rehabilitation of the degraded high and coppice forests with special care in the conversion of the coppice forests.
- The prohibition of clear-cuttings in coppice forests. Clear-cuttings are prohibited in high forests in Greece but not in coppice ones. However, an effort of converting oak and beech coppices into high forests has begun many years ago. The first results are very optimistic and the application of the acquired knowledge and experience towards a better result is a political choice.

Currently, there are no established SRC plantations in Greece for bioenergy exploitation purposes or for wood chips boilers for heat production are not implemented. Only experimental SRC plantations have been established, so far, testing productivity, yields and other parameters, affecting the production of wood chips for energy exploitation. Species have been used in these plantations were poplars, eucalyptus, black locust and willow[15]

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COPPICE FORESTS IN ITALY

TRANSLATION & DEFINITION

"Coppice forest" in Italian:	Ceduo
Definition of "Coppice":	Coppice is a silvicultural system which is based on the capacity of many tree plants to sprouting from the stools if cut down. Coppiced woods are therefore mainly constituted by sprouts, a number of shoots (stools) that emerge from each coppiced tree stool [1]

STATISTICS

Total forest area:	10 467 533 ha	35 % of country area [2]
Distribution of forest area in:	13 % Conifer	68 % Broadleaf [2]
Forest ownership:	32 % Public	63 % Private [2]
Total coppice forest area:	3 663 143 ha	35 % of forest area [2]
Short rotation coppice area:	6 500 ha	< 1 % of forest area [3]
Main coppice species:	Oaks (*Quercus cerris* L., *Q. pubescence* Willd, *Q. ilex* L.), sweet chestnut (*Castanea sativa* Miller), beech (Fagus sylvatica L.) [4], and poplar (*Populus* spp.)[3].	
Main coppice products:	Wood for fuel, manufacturing furniture, frames, wood utensils, and basketry; production of energy pellets, food products (like chestnut fruit) [5] and bioenergy.	

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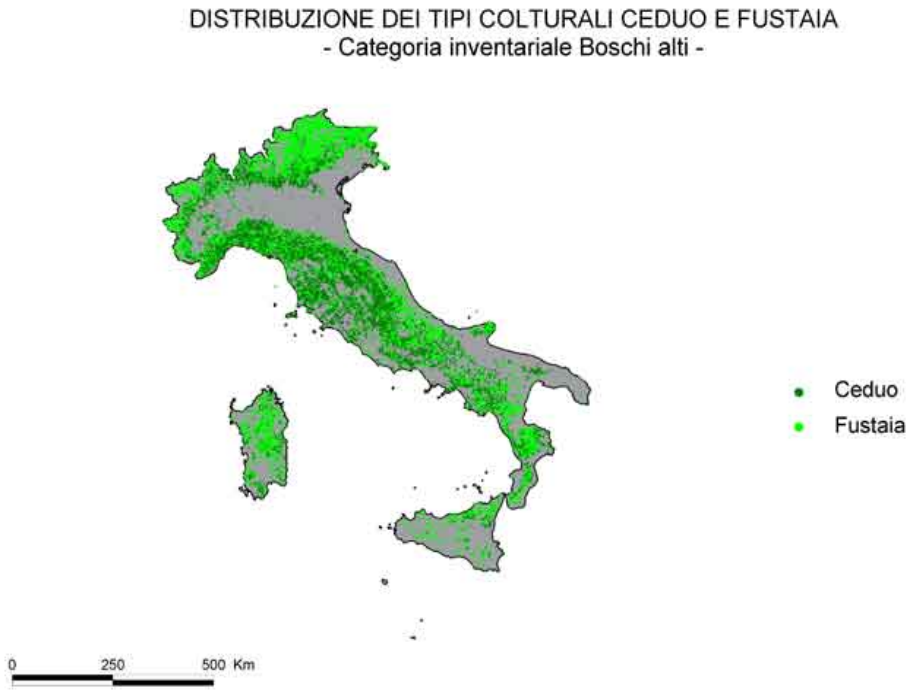
DISTRIBUTION – MAP [2]



PICTURE OF A TYPICAL COPPICE FOREST STAND [4]

Fig: a typical clearcut in a beech coppice with standards in Central Italy

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EXPLANATORY TEXT

In all of its differentiated ecosystems the Italian forest heritage is mainly represented by the coppice wood with main characteristic of renewing itself from the stump which is a reproductive feature that is maintained over time in different ways and depending on the different species. People in Italy have utilized this regrowth characteristic for centuries to produce small poles and firewood[5]. The chestnut tree, a source of both fruit and wood, preserves forever its own agamic reproductive capacity especially in fertile environment[5]. Large areas of beech forests are also managed as coppice for the production of firewood and charcoal[4]. In Italy, short rotation coppicing includes poplar, salix, black locust, and eucalyptus; however, most plantations consist of specific poplar clones[3]. Economic and social changes in the last decades have also supported widespread conversion of many coppices into high forests[4].

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[1] FutureForCoppices. Retrieved July 07, 2016 from http://www.futureforcoppices.eu/en/

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COPPICE FORESTS IN LATVIA

TRANSLATION & DEFINITION

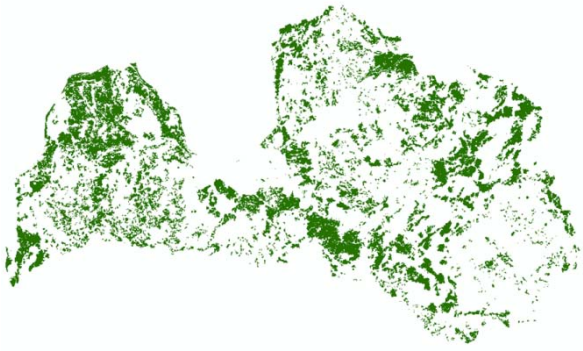
"Coppice forest" in Latvian: (īscirtmeta) atvasāju stādījumi

Definition of "Coppice forest": Short rotation coppice are areas planted with certain tree species, where the tree roots and stumps are left in the soil after harvesting and in the next vegetation season gives new shoots. The maximum rotation period of SRC is five years.[1]

STATISTICS

Total forest area:	3 197 000 ha	50 % of country area [2]
Distribution of forest area in:	45 % Conifer	55 % Broadleaf [3]
Forest ownership:	46 % Public	54 % Private/other [4]
Traditional coppice forest area:	457 802 ha[5]	14 % of forest area *
Short rotation coppice area:	672 ha[6]	% of forest area*
Main coppice species:	*Populus spp., Salix spp.,* grey alder *(Alnus incana (L.) Moench)* [7]	
Main coppice products:	Biomass (woodchips, firewood), CO_2 assimilation, pollination [8]	

DISTRIBUTION – MAP [9]



· statistics that are shown describe the total area of traditional species for coppice. Statistics for traditional coppice forest area are not available.

· ·short rotation coppices are mainly grown on agricultural lands.

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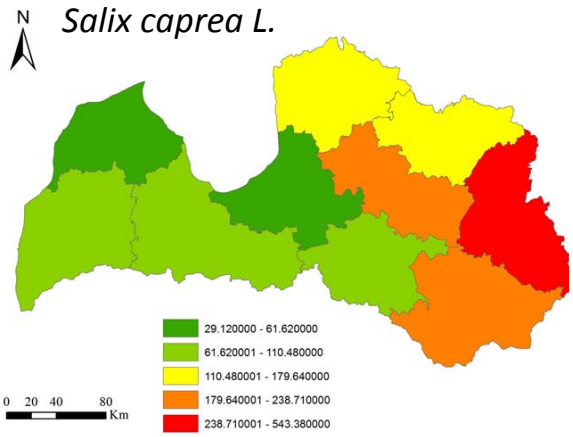

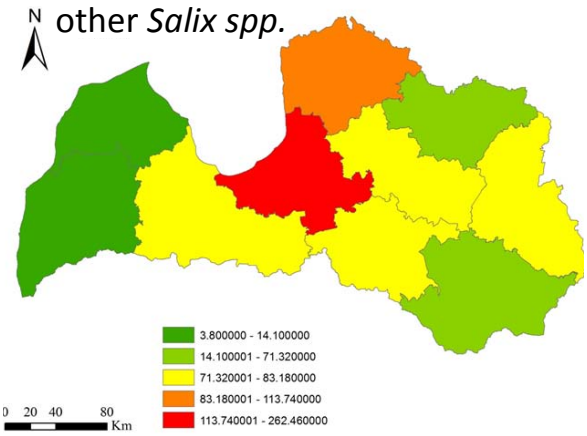

PICTURE OF A TYPICAL COPPICE FOREST STAND [10]

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EXPLANATORY TEXT[11]

Due to the legislation in Latvia, SRC plantation can be either agricultural crops or plantation forests. Owners of young plantation forests have property tax incentives. SRC plantations are slowly gaining recognition and popularity in Latvia. However, there is a lack of statistical data about SRC or any other form of coppice forest. Direct payment registration reports provide partial information about SRC plantations grown on agricultural lands. Short rotation period for woody crops is quite suitable for willow, but considering the conditions in Latvia, might not be sufficient for species such as aspens and alders.

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[2] Central Statistical Bureau of Latvia. Available: http://data.csb.gov.lv/pxweb/en/lauks/lauks__ikgad__mezsaimn/MS050.px/table/tableViewLayout1/?rxid=cdcb978c-22b0-416a-aacc-aa650d3e2ce0

[3] Central Statistical Bureau of Latvia. Available: http://data.csb.gov.lv/pxweb/en/lauks/lauks__ikgad__mezsaimn/MS050.px/table/tableViewLayout1/?rxid=cdcb978c-22b0-416a-aacc-aa650d3e2ce0

[4] Central Statistical Bureau of Latvia. Available: http://data.csb.gov.lv/pxweb/en/lauks/lauks__ikgad__mezsaimn/MS150.px/table/tableViewLayout1/?rxid=cdcb978c-22b0-416a-aacc-aa650d3e2ce0

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[9] Map of forest cover in Latvia – JSC Latvia's State Forests http://www.lvm.lv/geotelpiskie-dati/lvm-meza-kvartalu-geotelpiskie-dati *Salix* distribution maps – Irena Pucka, Daugavpils University.

[10] Photos: Dagnija Lazdina, senior researcher at the Latvian State Forest Research Institute *"Silava"*.

[11] SRC production in Croatia, Czech Republic, France, Germany, Greece, Latvia and Macedonia. Eds. Dimitriou, I., Rutz, D., Mergner, R. (2014). Short Rotation Woody Crops (SRC) plantations for local supply chains and heat use. Project No: IEE/13/574. Sweden, 51 p. Available: http://www.srcplus.eu/images/SRC_Production.pdf

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COPPICE FORESTS IN LITHUANIA

TRANSLATION & DEFINITION

"Coppice forest" in Lithuanian:	atauginės kilmės savaiminis medynas
Definition of "Coppice forest":	Savaiminės kilmės medynas, atsikūręs kelmų ir/ar šaknų ataugomis-atžalomis[1]

STATISTICS

Total forest area:	2179 900 ha area [1]	33.4 % of country
Distribution of forest area in:	56 % Conifer	44 % Broadleaf
Forest ownership:	60.3 % Public	39.7 % Private
Traditional coppice forest area:	-	- % of forest area
Short rotation coppice area:	-	- % of forest area
Main coppice species:	Grey Alder, Black Alder, European Ash, Aspen, Small-leaved Lime, Common Oak.	
Main coppice products:	Firewood, furnitures, plywood	

DISTRIBUTION – MAP

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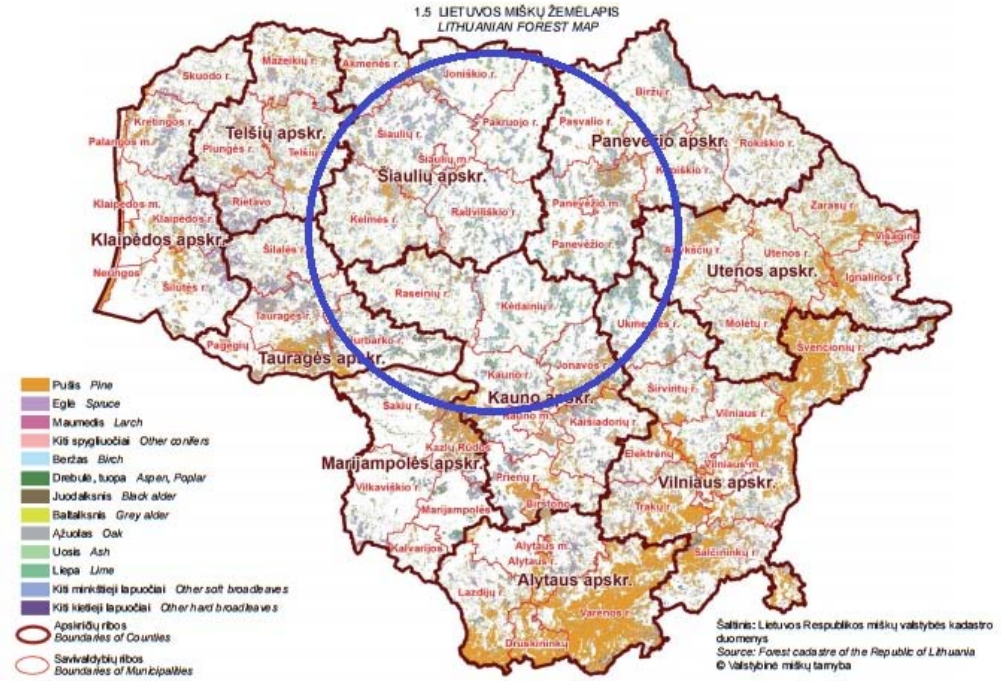

PICTURE OF A TYPICAL COPPICE FOREST STAND

EXPLANATORY TEXT

Coppice forestry in Lithuania is not widely known and used. In some habitats seedling restoration is combined with stumps branching (coppicing). There is no accounting for such forestry management.

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COPPICE FORESTS IN MONTENEGRO

TRANSLATION & DEFINITION

"Coppice forest" in Montenegrian: Izdanačke šume

Definition of "Coppice forest": Coppice systems, one of the oldest known management systems, are known for its vegetative reproduction from buds on cut stumps and roots.[1]

STATISTICS

Total forest area:	964262,0 ha	69,4% of country area [2]
Distribution of forest area in:	23,8% Conifer	76,2 % Broadleaf [3]
Forest ownership:	50,9 % Public	49,1 % Private [4]
Traditional coppice forest area:	351872,8 ha	48,4 % of forest area [5]
Short rotation coppice area:	0 ha	% of forest area [6]
Main coppice species:	Fagus sylvatica and Quercus cerris[7]	
Main coppice products:	Firewood and [8]	

DISTRIBUTION – MAP [9]

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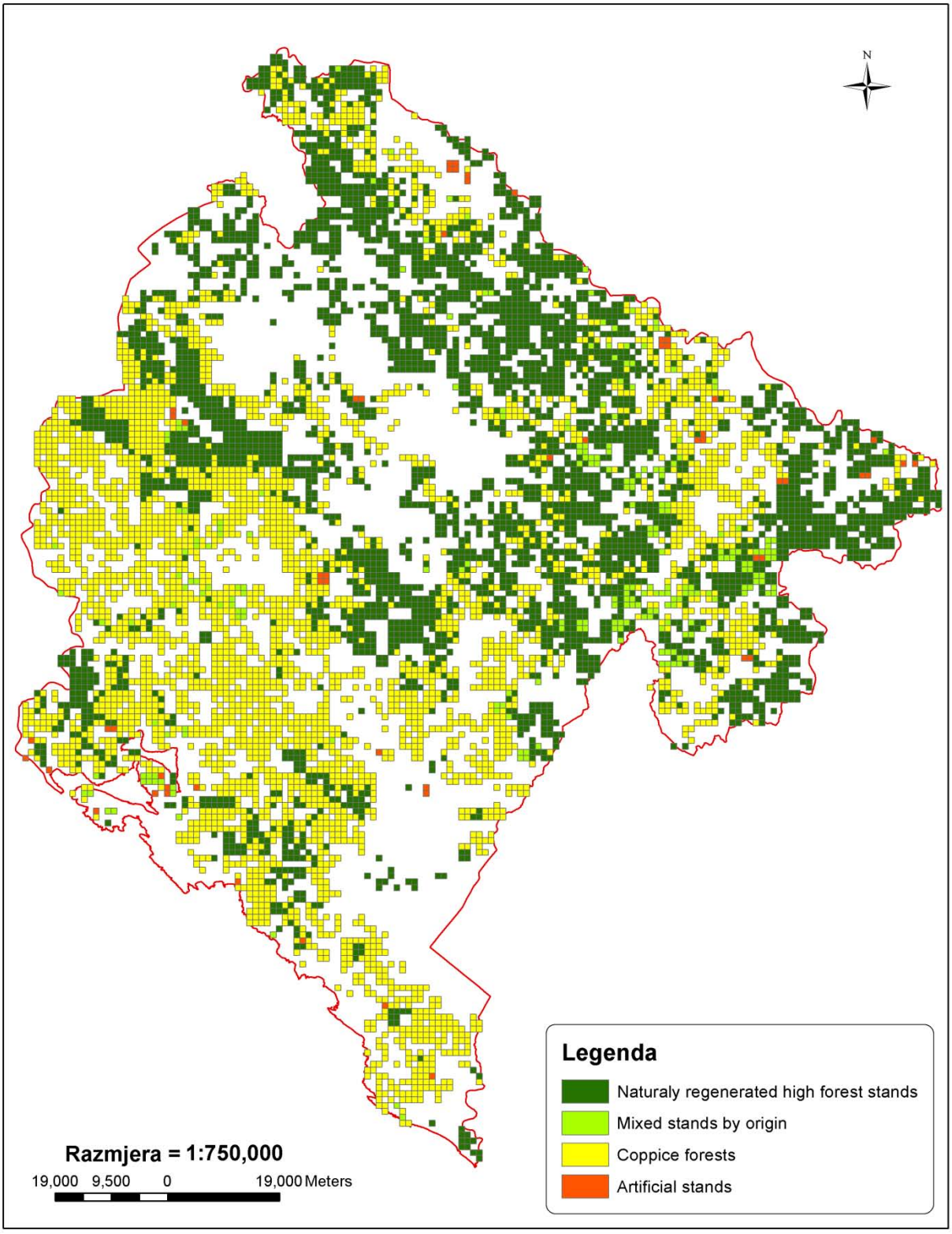
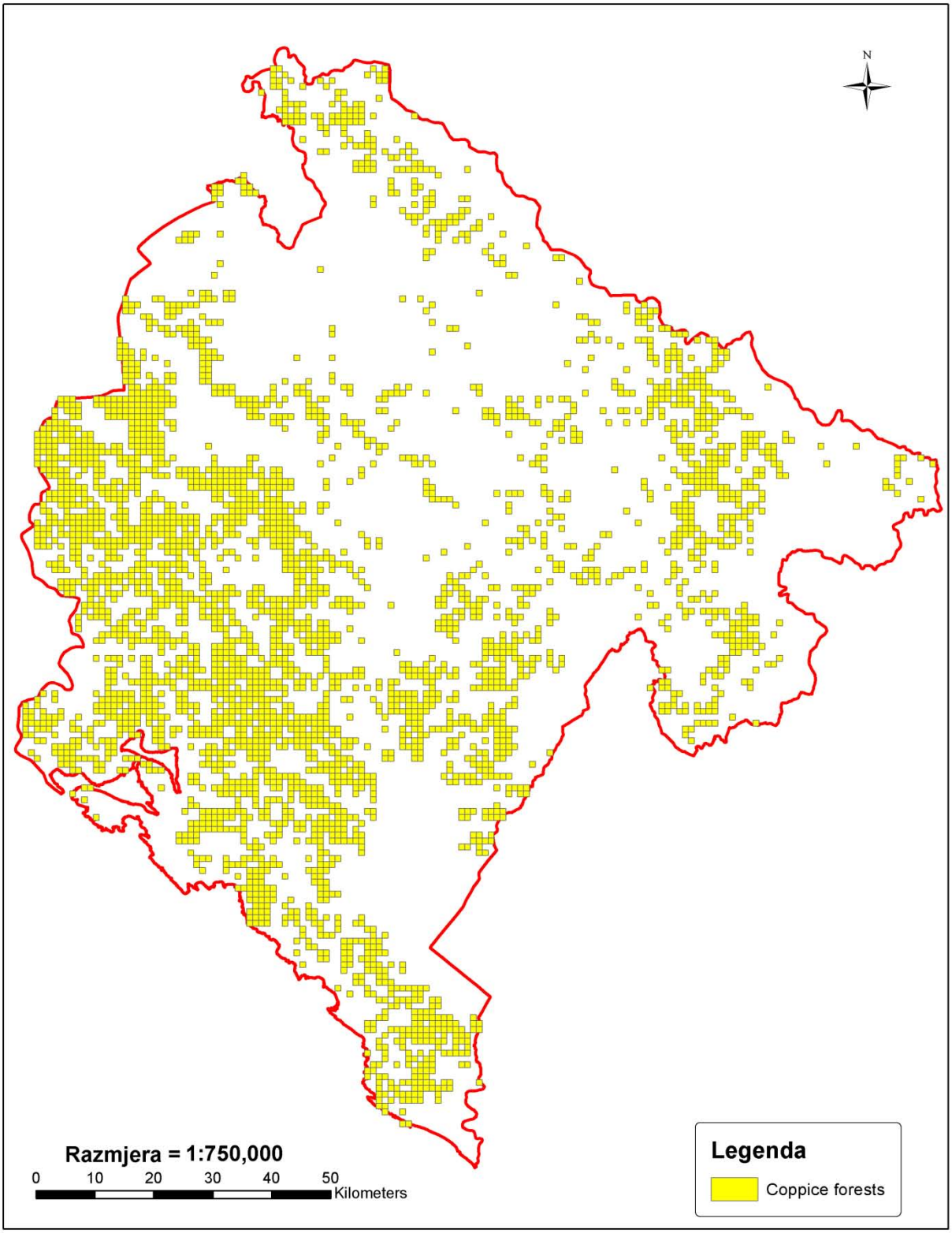


Author: Milan Gazdić Email: gazdic.milan@gmail.com



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PICTURE OF A TYPICAL COPPICE FOREST STAND [10]

EXPLANATORY TEXT

The largest part of coppice forests is in the south of the country. In public forests, 70% is high forests and 30% is coppice forests. In private forests situation is reversed, 70 % is coppice forests and 30 % is high forests.

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[2] First National Inventory of Montenegro (2013)
[3] First National Inventory of Montenegro (2013)
[4] First National Inventory of Montenegro (2013)
[5] First National Inventory of Montenegro (2013)
[6]
[7] First National Inventory of Montenegro (2013)
[8] First National Inventory of Montenegro (2013)
[9] First National Inventory of Montenegro (2013)
[10]

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COPPICE FORESTS IN POLAND

TRANSLATION & DEFINITION

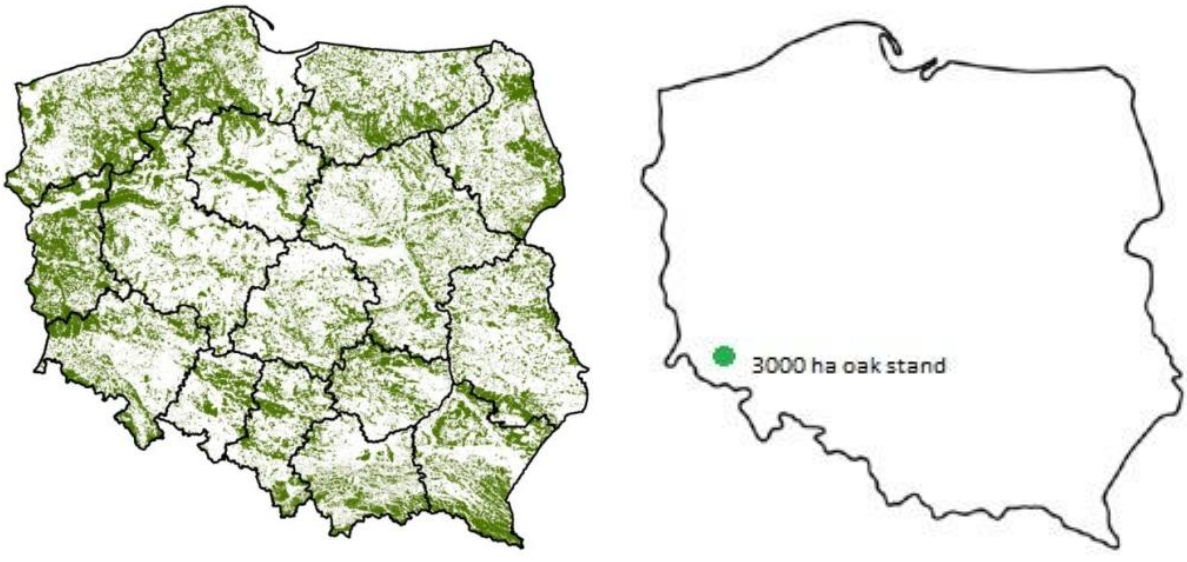
"Coppice forest" in Polish:	Las odroślowy (las niskopienny)
Definition of "Coppice forest":	forest that is re-grown from shoots after the original trees were fallen[1]

STATISTICS

Total forest area:	9197900 ha 29,4 % of country area [2]
Distribution of forest area in:	69,1 % Conifer 31,9 % Broadleaf [3]
Forest ownership:	81 % Public 19 % Private [4]
Traditional coppice forest area:	3000 ha 0,033 % of forest area [11]
Short rotation coppice area:	11508 ha 0,125 % of forest area [5]
Main coppice species:	hornbeam, alder, ash, elm, maple, birch, lime, oak [6] willow, poplar[6]
Main coppice products:	biomass, firewood [7]

DISTRIBUTION – MAP [8]

(1) regional distribution of total forest area (2) coppice area



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PICTURE OF A TYPICAL COPPICE FOREST STAND [9]

EXPLANATORY TEXT

Traditional coppicing is not longer practiced in Poland. Mainly because of the ownership structure (most forests are maintained by one, state-own company). There are still some remnants of coppice forests here and there, composed mainly of alder and (less often) oak and hornbeam.[7] The biggest stand-alone coppice area (about 3 thousand hectares) is located in South of Poland in Sudety Mountains[11]. There are also some remnants of beech coppice forests in Polish Western Carpathians. Data about the exact locations and total area are hard to obtain. There is an increase of the area of short rotation coppice stands (mainly willow and poplar)[6]

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REFERENCES:

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[11]Szymura T. 2010. Tradycyjna gospodarka odroślowa w Europie Środkowej i jej wpływ na różnorodność biologiczną (The traditional coppice management system in Central Europe and its impact on biological diversity). Sylwan 154 (8): 545−551.

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COPPICE FORESTS IN POLAND

TRANSLATION & DEFINITION

"Coppice forest" in Language:	Las odroślowy, las niskopienny
Definition of "Coppice forest":	Forest created as a result of the renewal of the tree stand. Consists in making cuts on time, in the way conducive to the formation of offshoots.[1]

STATISTICS

Total forest area:	9 197 900 ha	29,4 % of country area [2]
Distribution of forest area in:	69,1 % Conifer	30,9 % Broadleaf [2]
Forest ownership:	81 % Public	19 % Private [2]
Traditional coppice forest area:	no data	no data
Short rotation coppice area:	no data	no data
Main coppice species:	Willows (*Salix sp.*) Black alder (*Alnus glutionsa*) - rare Quercus robur, Q. petraea, Carpinus betelus, Tilia sp. – very rare[3]	
Main coppice products:	biomass production, firewood[3]	

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DISTRIBUTION – MAP [4]

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PICTURE OF A TYPICAL COPPICE FOREST STAND [5]


Willow plantation and willow pollarding in Poland.

EXPLANATORY TEXT

In Poland, most important document about state of polish forests don't define coppice forests but include this type of forests as forested area. In the Pogórze Kaczawskie (Sudety Mountains) there have preserved oak coppice stands – the remains of the former German management. They were grown for the purposes of tanbark production, and the rotation period was 14 years[6]. Nowadays coppice management in Poland is practically unknown witch few exceptions of alder stands and topping of willows and poplars[7]. However, due to the demand for renewable energy sources, increases the number of plantation cultivating some cultivars of fast growing willow trees (9 000 ha)[8].

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REFERENCES:

[1] Little Encyclopedia of Forest, PWN Warsaw 1980.
[2] Forests in Poland 2015, Information Center of State Forests, Warsaw 2015.
[3] Practical Aspects of Use of Renewable Energy Sources, PFRR Białystok 2006.
[4] Bank data of forests. (http://www.bdl.lasy.gov.pl).
[5] Pomorski Landscape Nature Parks (http://parkmierzeja.pl).
[6] Duncker A. 1867−1868. Die ländlichen Wohnsitze, Schlösser und Residenzen der Ritterschaftlichen. 10 (597) after Tomasz H. Szmura.
[7] Tomasz H. Szmura. The traditional coppice management system in Central Europe and its impact on biological diversity. Sylwan 154 (8): 545−551, 2010.
[8] Stolarski M.J. 2013. Plantations of fast growing trees and shrubs as alternative for wood from forest – private resource bases. National Forest Program. Expert panel – Climate. Forest Research Institute (in polish).

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COPPICE FORESTS IN POLAND

TRANSLATION & DEFINITION

"Coppice forest" in Polish: Las odroślowy, las niskopienny

Definition of "Coppice forest":

(scientific) Type of forest, regenerated by cut trees in appropriate manner and conditions, favour for offshoots growing [1]

STATISTICS (BY THE END OF 2014)

Total forest area:	9,198 mln ha	30 % of country area [2]
Distribution of forest area in:	69 % Conifer	31 % Broadleaf [2]
Forest ownership:	81 % Public	19 % Private [2]
Traditional coppice forest area:	no data	
Short rotation coppice area:	no data	
Main coppice species:	Willows (*Salix sp.*) [3]	
Main coppice products:	Firewood [3]	

DISTRIBUTION – MAP [4]

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PICTURE OF A TYPICAL COPPICE FOREST STAND

[LEF] Overgrown coppice stand in the "Wąwóz Lipa" Reserve (Kaczawskie foothills, Lower Silesia)[5] and [RIGHT] Pollarding in Poland – still very popular source of firewood in private sector.

EXPLANATORY TEXT

Apogee of coppicing in Silesia (only this area have well documentation) started in 3rd decade of XIX century, when high value of tanbark reorientated production for this goods and area of coppice forests reached ca 13 200 ha. Last decade of XIX brought decrease in profitability of coppicing and limited it to slopes. Coppice forests reached maximal area ca 16 000 ha. After World War II coppice forests were converted to high forests [5, 6]. In this times pollarding of willows became very popular for firewood purposes in Poland. The most important document[7] about state of polish forests of all forms of ownership include coppice forests as forested area if particular terms of “polish forest definition” are fulfilled. Central Statistical Office in Poland, where data about forest management is available (yearly reports[2]), don’t collect data about coppicing. In polish public forests renewing forests in vegetative way (not literally as stump

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sprouts or root suckers) is allowed, when it is compatible with planned stand species composition[8].

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1 http://www.encyklopedialesna.pl/hasla/index/8614 (in polish).

2 Forestry 2015. Central Statistical Office. Warsaw (http://stat.gov.pl/en/topics/agriculture-forestry/forestry/forestry-2015,1,6.html).

3 Own knowledge.

4 Jaworski A. 2011. Silviculture. Ways of management, forest regeneration, stands reconstruction and transformation. PWRiL. Warsaw (in polish).

5 Szymura T.H. 2010. The traditional coppice management system in Central Europe and its impact on biological diversity. Sylwan 154 (8): 545-551 (in polish).

6 Szymura T.H. 2014. Influence of land relief and soil properiets on stand structure of overgrown oak forest of coppice origin with *Sorbus torminalis*. Dendrobiology 71: 49-58.

7 Forest Act from 28 IX 1991 (in polish).

8 Principles of silviculture 2012. The State Forests National Forest Holding (in polish).

COPPICE FORESTS IN ROMANIA

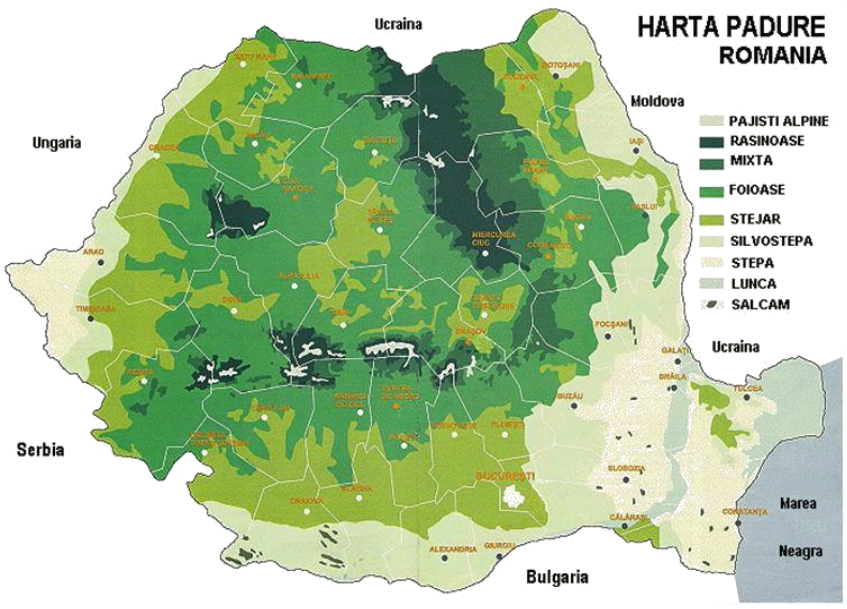
TRANSLATION & DEFINITION

"Coppice forest" in Romanian:	Crâng, subarboret
Definition of "Coppice forest":	Grove of young trees and shoots, shrubs or bushes; underwood, thicket[1]; Forest regeneration in vegetative way (from sprout), carried out in a short period of time (1-40 years)[2].

STATISTICS

Total forest area:	6.900.962 ha	29 % of country area[3]
Distribution of forest area in:	26 % Conifer	74 % Broadleaf[3]
Forest ownership:	49 % Public	51 % Private[4]
Traditional coppice forest area:	0 ha	0 % of forest area[5]
Short rotation coppice area:	0 ha	0 % of forest area[5]
Main coppice species:	oak, hazel, ash, maple, willow, poplar[6]	
Main coppice products:	poles, fences, constructions, energy[6]	

DISTRIBUTION – MAP[5]



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PICTURE OF A TYPICAL COPPICE FOREST STAND [7]

EXPLANATORY TEXT

Historically, in old documents, Coppice forests are often mentioned, and the phrase "*next to the coppice [name]*" was used to designate Romanian place-names[6]. However, these days, coppice as a woodland management method, is not used anymore, mainly because the decreased in rural population and the shift in daily occupation in the life of the peasants.

On the other hand, coppicing trees, as a technique for vegetative reproduction is a method used for natural regeneration of broadleaved forests made up of species that have the capacity to sprout (around 4% of the cutted wood area has been regenerated in this way)[3,4].

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[3] National Forest Inventory in Romania, available online at http://www.roifn.ro
[4] ROMSILVA, National Forest Service, available online at http://www.rosilva.ro
[5] National Institute of Statistics, Romanian Statistical Yearbook - 2014, 671 pp.
[6] Giurescu C.C., Istoria padurii romanesti din cele mai vechi timpuri pina astazi, Ceres Publishing House, 1976, 394 pp.
[7] Personal picture, taken on 23 March 2016, Bacau County, Romania

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COPPICE FORESTS IN ROMANIA

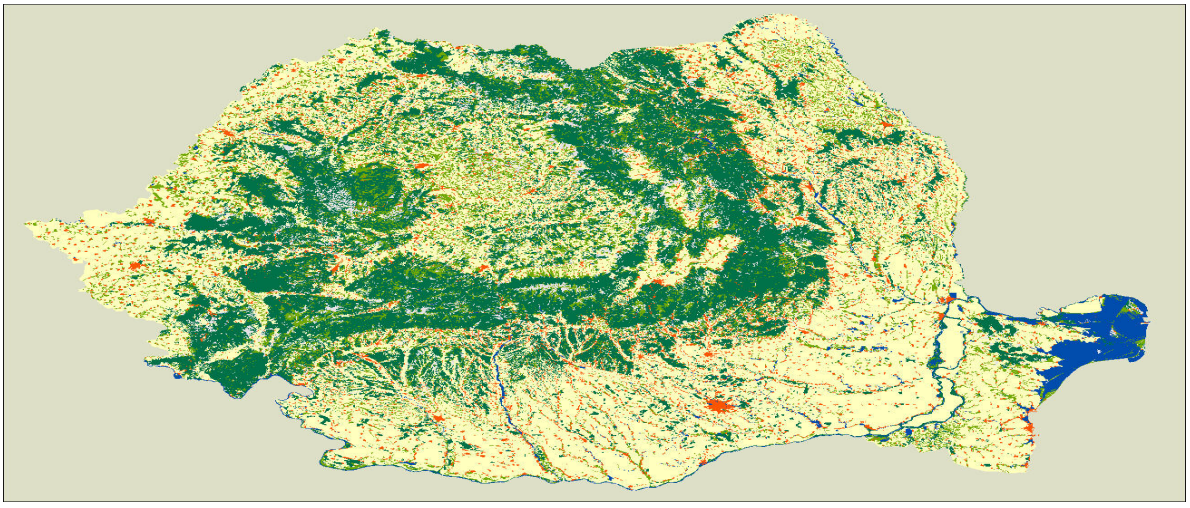
TRANSLATION & DEFINITION

"Coppice forest" in Romanian:	Crâng
Definition of "Coppice forest":	General management of forests, based on vegetative regeneration./ Forest regeneration vegetatively from cuttings , suckers or slips is named coppice [1]

STATISTICS

Total forest area:	6900000ha	29% of country area [2]
Distribution of forest area in:	26 % Conifer	74 % Broadleaf [3]
Forest ownership:	49 % Public	51 % Private [4]
Traditional coppice forest area:	No Data	No Data
Short rotation coppice area:	No Data	No Data
Main coppice species:	Beech,hornbeam,linden,oaks,poplars,locust[5]	
Main coppice products:	Fire wood, rural construction[6]	

DISTRIBUTION – MAP [7]



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PICTURE OF A TYPICAL COPPICE FOREST STAND [8]

EXPLANATORY TEXT

By Romania's constitution on April 13, 1948 all forests in the country were nationalized by the communist regime , before that date Romanian forests were 6326000 hectares and the state held only 25% of this area . Before this 73 % of this area was led into hight-forest System and 27% in coppice –system. In terms of composition 24 % were Conifer and 76 % were Broadleaf .

Today forest occupy 6900962 hectares and after forest restitution to former owners state holds 49 % from this . Communist regime led a campaign to increase the surface covered with conifers and the result was an increase from 24% to 26 %. But the coppice forest area fell from 27% to 5 %[9] by conversion of the coppice forest regime to high-forest system .

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COPPICE FORESTS IN SPAIN

TRANSLATION & DEFINITION

"Coppice forest" in Spanish:	Monte bajo
Definition of "Coppice forest":	Vegetatively propagated forest composed of trees growing from stumps and/or root shoots[1].

STATISTICS

Total forest area (2012):	27,715,206 ha	54.8% country area[2]
Distribution of forest area in:	37% Conifer	55 % Broadleaf[3]
Forest ownership:	33 % Public	67 % Private[4]
Traditional coppice forest area:	4,500,000ha	16.3% of forest area [2]
Short rotation coppice area (*Eucalyptus*):	633,000ha	2.28% of forest area[4]
Main coppice species:	*Castanea sativa*, *Eucalyptus globulus*, *Populus* spp., *Salix* spp., *Quercus pryneaica*, *Quercus ilex* and *Quercus faginea*[1].	
Main coppice products:	Firewood and other types of biomass (pellets, chips, etc), wood, pulp and paper, forest fruits and recreational uses.	

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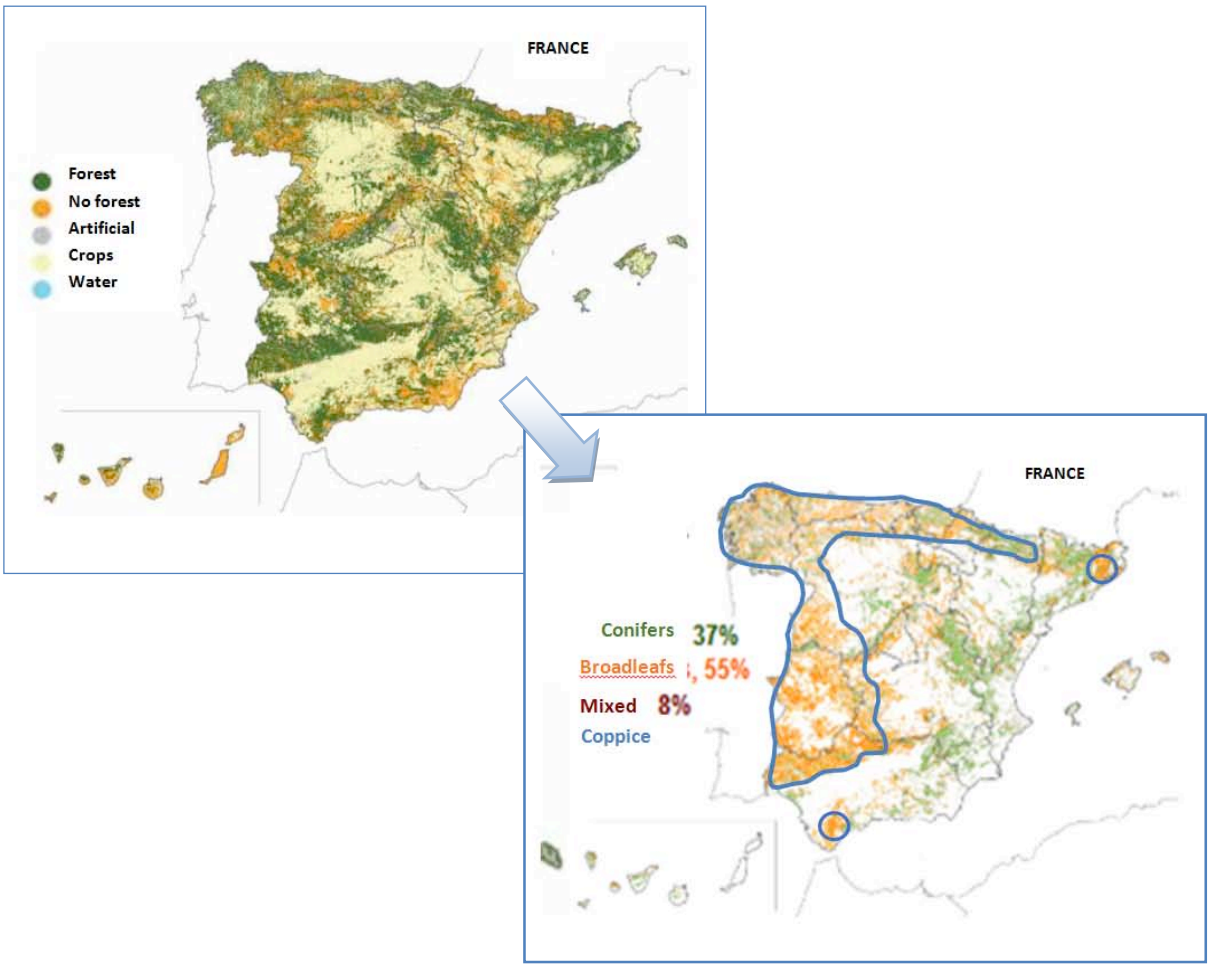
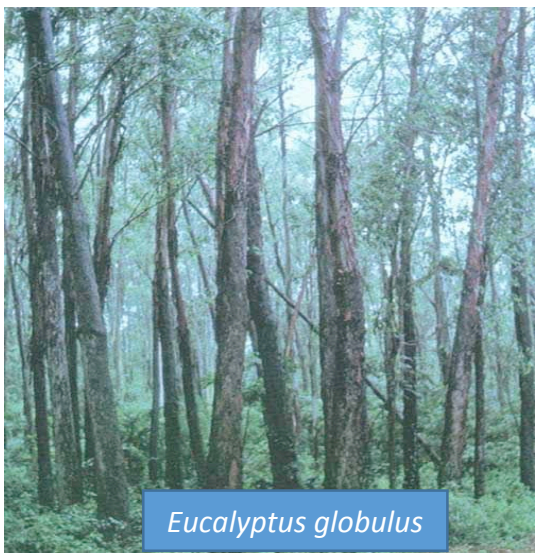
DISTRIBUTION – MAP[3]



PICTURE OF A TYPICAL COPPICE FOREST STAND[5]



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EXPLANATORY TEXT

In Spain there are currently approximately 4.5 M ha of coppice stands. In the past, these stands were traditionally managed with final cuttings to provide firewood or charcoal. In the last 30 years this trend has changed due to the emergence of new energy sources, and these traditional forests have been abandoned. These non-managed stands result in overstocking, which can lead to a high risk of pests, illnesses and wildfires, in addition to the degradation and decay of forests.

The traditional coppice forests in Spain are composed of broadleaf species: *Castanea sativa*, *Salix* spp. and *Quercus pryneaica*, *Quercus ilex* and *Quercus faginea*, which are used for wood, firewood or fruits. Nowadays, however, other fast growing genus, like *Eucalyptus* and *Populus,* are used for pulpwood and biomass production. In addition, other, less important, broadleaf species can also be found as coppice stands in Spain, e.g. *Quercus robur* and *Fagus sylvatica*.

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[5]Image bank of Forest and Wood Technology Research Centre (CETEMAS).

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COPPICE FORESTS IN SWITZERLAND

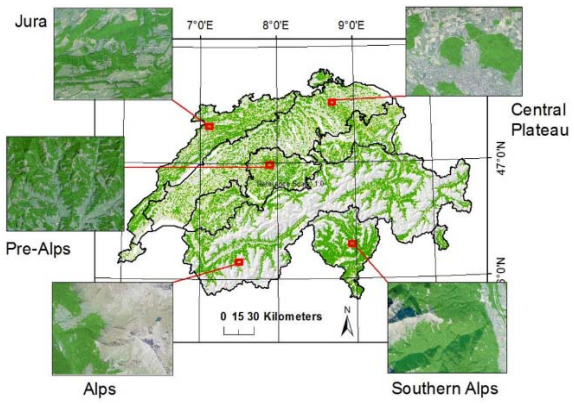
TRANSLATION & DEFINITION

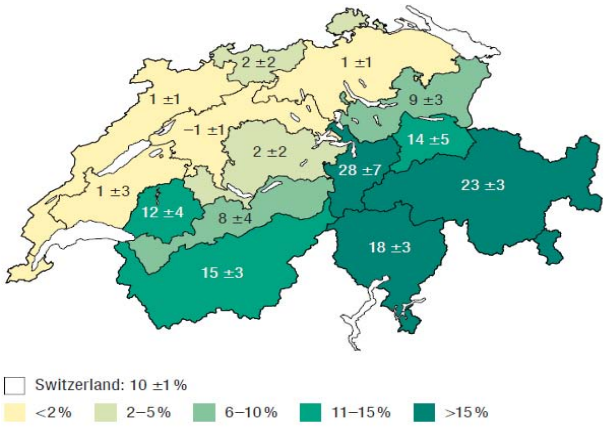
"Coppice forest" in	English
Definition of "Coppice forest":	Forest grown from sprouts or root shoots on a short rotation period e.g. 3 years, the oldest form of regulated forest use, mostly for firewood.[1]

STATISTICS

Total forest area:	1,254 m ha [2]	30.4% of country area
Distribution of forest area in:	43 % Conifer	25 % Broadleaf [3]
Forest ownership:	70 % Public	30 % Private [4]
Traditional coppice forest area:	XXX XX ha	XX % of forest area [5]
Short rotation coppice area:	XXX XX ha	XX % of forest area [6]
Main coppice species:	Oak, birch, hornbeam, sycamore, black locust, chestnut, black alder [7]	
Main coppice products:	Renewable energy sources (wood) [8]	

DISTRIBUTION – MAP[9]





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PICTURE OF A TYPICAL COPPICE FOREST STAND [10] [11]

EXPLANATORY TEXT

Coppice forests in Switzerland are particularly species-rich habitats and make a contribution to the preservation of cultural and historical diversity. Regular cutting is done on 3- to a maximum of 40-year-old rotation for wood production, biodiversity conservation and other ecosystem services.[12]

Legally, measures for the maintenance of coppice forest may be eligible for funding within the framework of contractual nature conservation programs in the forestry sector e.g. "Nature Conservation in Forests" program in Switzerland. Generally, in natural reserves, coppicing is encouraged to promote biodiversity and landscape conservation.[13]

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[5] Add reference here

[6] Add reference here

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COPPICE FORESTS IN UNITED KINGDOM

TRANSLATION & DEFINITION

"Coppice forest" in English:	Coppice woodlands
Definition of "Coppice forest":	Woodland in which the trees have been coppiced. Coppicing is a form of woodland management where trees are cut periodically near the ground level allowing them to regrow from the cut stumps.[1]

STATISTICS

Total forest area:	3,079,000 ha	13 % of country area [2]
Distribution of forest area in:	56% Conifer	44 % Broadleaf [3]
Forest ownership:	28 % Public	72 % Private [4]
Traditional coppice forest area:	Not found ha	not found % of forest area [5]
Short rotation coppice area:	3000 ha	0,1% of forest area [6]
Main coppice species:	Alder, ash, birch, field maple, hazel, oak, sallow, small-leaved lime, sycamore, sweet chestnut and Wych elm [7]	
Main coppice products:	Fencing, Charcoal, Fuel, Building, Tan-bark, Turnery, Crafts [8]	

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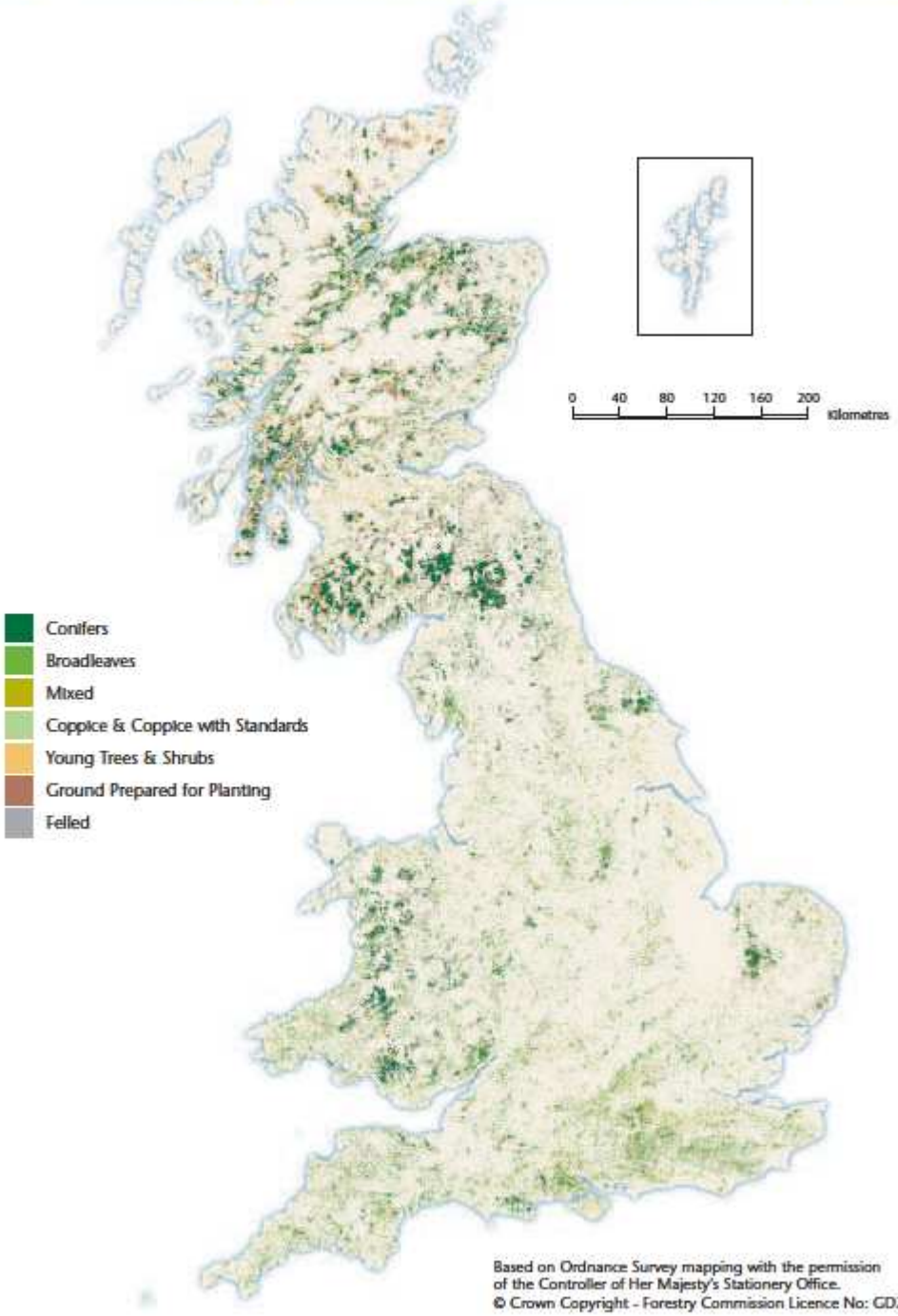
DISTRIBUTION – MAP [9]

Map 4 Distribution of woodland over 2 hectares by Interpreted Forest Type



Reference Date 31 March 1995–98

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PICTURE OF A TYPICAL COPPICE FOREST STAND [10]

EXPLANATORY TEXT

The active coppice management of coppice has been declining over the last 50 years [11], and many of the remaining are neglected. Currently the positive impact of coppice on the environment along with the revival of traditional country crafts has led to an increasing interest in these woodlands. In this context, the UK government is generating policies such as grants aiming to stimulate the development of managed forests, particularly coppice [12]. This will probably lead to the creation of new coppiced woodland, managed both for improve wildlife and to produce energy crops for local use. For example, wood from poplar and willow produced by short rotation coppice are currently being used as a source of non-fossil fuel in several areas of the British countryside [13].

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COPPICE FORESTS IN UKRAINE

TRANSLATION & DEFINITION

"Coppice forest" in Ukrainian:	Порослеві деревостани
Definition of "Coppice forest":	Coppice tree stands (coppice forests) – tree stand produced from vegetative shoots, cut or damaged stems or roots (p. 289) [1]

STATISTICS

Total forest area:	9. 6 million ha 15.9 % of country area [2]
Distribution of forest area in:	43.7 % Conifer 43.9 % Broadleaf [3]
Forest ownership:	99.9 % Public 0.1 % Private [4]
Traditional coppice forest area:	1037 thousand ha (Coppice forests within forests of State Forestry Agency Forest Resources of Ukraine) 16,5 % of forest area [5]
Short rotation coppice area:	At present the several experimental plots are established on the small areas[6]
Main coppice species:	pedunculate oak (*Quercus robur* L.), common ash (*Fraxinus excelsior* L.), hornbeam (*Carpinus betulus* L.), European beech (*Fagus sylvatica* L.), Norway maple (*Acer platanoides* L.), sycamore (*Acer pseudoplatanus* L.) [7]
Main coppice products:	Coppice tree stands are mostly used for harvesting of timber or for firewood [8]

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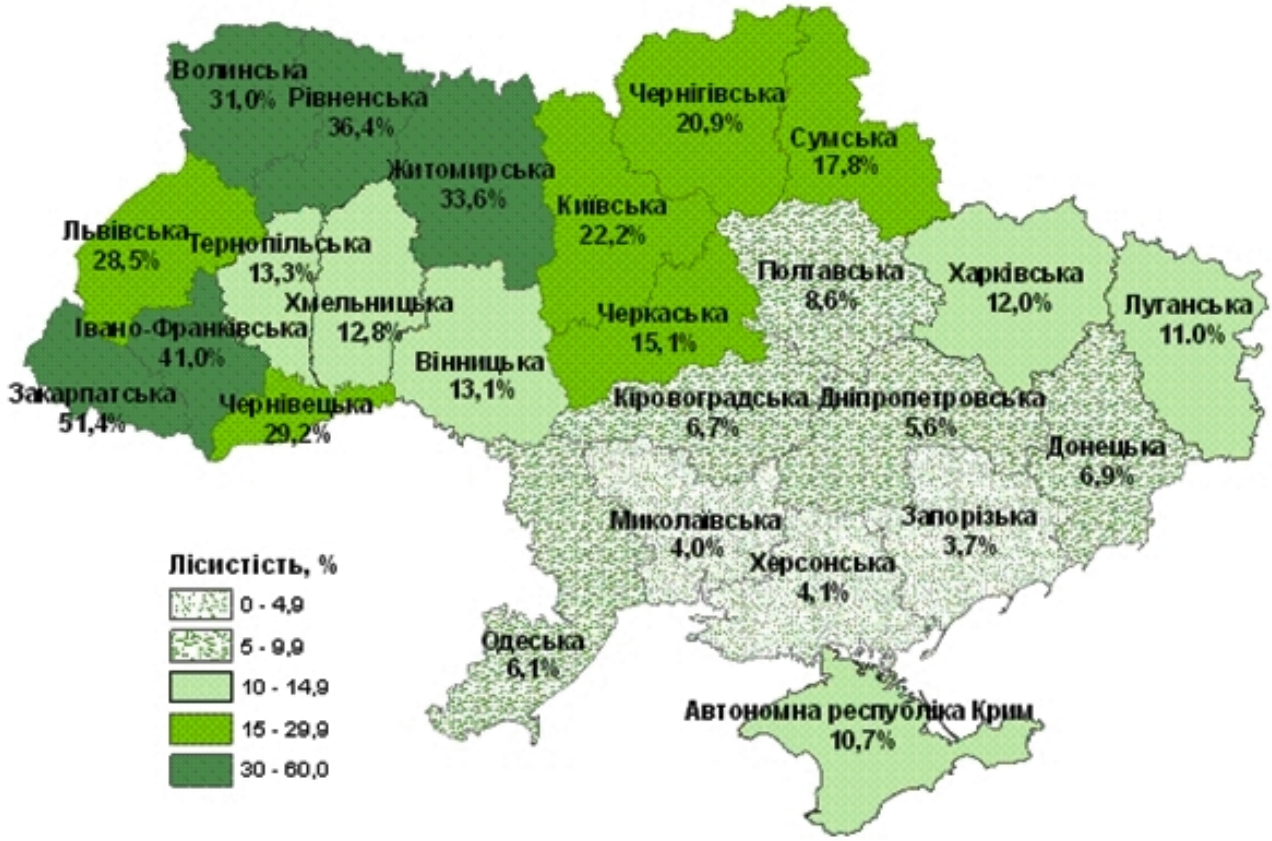
DISTRIBUTION – MAP [9]

Forests cover in Ukraine



Areas covered by forests on the territories of all administrative units in Ukraine (data 01.01.2011)

Territorial and administrative units in Ukraine	Total area, ha	Including land area, thousand ha	Land areas covered with forest vegetation, thousand ha	Land area covered by forest vegetation (data by State Forestry Agency), thousand ha	Coppice forests within forests of State Forestry Agency, %	Forest cover, %	
						by total area	by land area
Autonomous Republic of Crimea	2694,5	2477,5	301,5	229,9	67,8	10,7	11,7
Vinnytsia	2649,2	2606,2	346,5	199,9	8,0	13,1	13,3
Volyn	2014,4	1969,2	624,6	438,6	21,3	31,0	31,7
Dnipro	3192,3	3035,8	179,2	65,7	15,6	5,6	5,9
Donetsk	2651,7	2610,1	184,1	92,5	20,6	6,9	7,1

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Zytomyr	2982,7	2934,4	1001,6	660,6	16,9	33,6	34,1
Zakatpattia	1275,3	1257,1	656,7	460,8	2,0	51,4	52,2
Zaporizzia	2718,3	2542,8	101,0	34,0	8,8	3,7	4,0
Ivano-Frankivsk	1392,7	1369,3	571,0	426,5	3,7	41,0	41,7
Kiev	2812,1	2638,3	624,1	355,1	11,2	22,2	23,7
Kirovograd	2458,8	2383,4	164,5	103,4	20,4	6,7	6,9
Lugansk	2668,3	2646,4	292,4	228,2	32,7	11,0	11,1
Lviv	2183,1	2140,6	621,2	428,1	3,8	28,5	29,0
Mykolajiv	2458,5	2331,0	98,2	37,3	9,9	4,0	4,2
Odessa	3331,3	3118,2	203,9	90,2	20,8	6,1	6,5
Poltava	2875,0	2726,6	247,4	157,3	30,5	8,6	9,1
Rivne	2005,1	1962,9	729,3	588,5	15,3	36,4	37,2
Sumy	2383,2	2352,6	425,0	255,7	23,1	17,8	18,1
Ternopil	1382,4	1363,1	183,2	143,6	8,2	13,3	13,4
Kharkiv	3141,8	3081,9	378,3	282,3	32,7	12,0	12,3
Kgerson	2846,1	2412,9	116,3	77,3	14,1	4,1	4,8
Khmelnytsk	2062,9	2023,3	265,1	166,2	12,9	12,8	13,1
Cherkasy	2091,6	1955,2	315,1	255,5	12,6	15,1	16,1
Chernivtsi	809,6	791,1	236,7	160,4	5,7	29,2	29,9
Chernigiv	3190,3	3122,8	665,7	355,8	15,1	20,9	21,3
Totally	**60354,8**	**57929,1**	**9573,9**			**15,9**	**16,5**

Forest areas of the State Agency of Forest Resources of Ukraine

Total area, thousand ha	**Seed forest stands of natural origin, thousand ha**	**Forest planting, thousand ha**	**Coppice forests, thousand ha**
6293,5	2013,1	3243,1	1037,3
100,0	32,0	51,5	16,5

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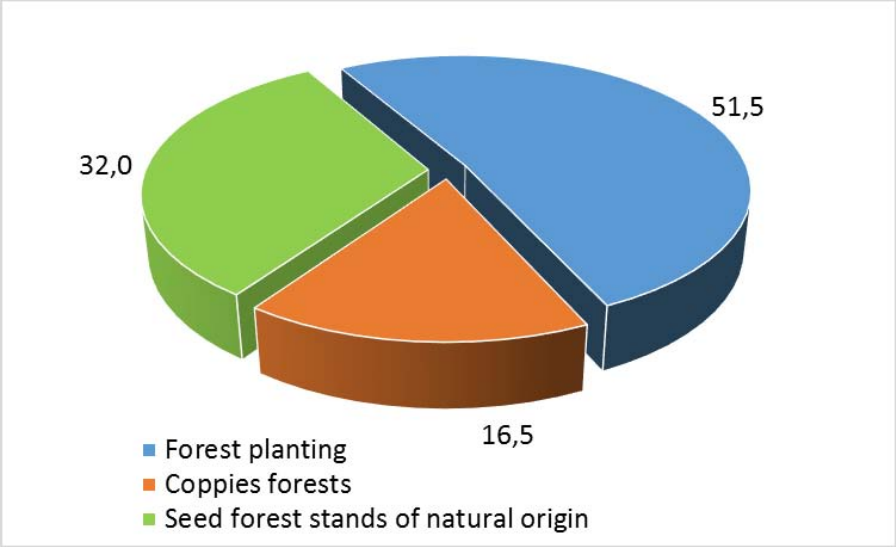

PICTURE OF A TYPICAL COPPICE FOREST STAND [10]

Coppies trees of black alder in the National Park "Galician" (Ivano-Frankivsk region).

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Willow trees are still used for producing brushwood and firewood by local residents (v. Pidgorodtsi, Skole district, Lviv region).

The private garden planted with willows for further producing firewood (v. Krushelnytsya, Skole district, Lviv region).

EXPLANATORY TEXT

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Coppice forests in Ukraine were established as the result of insufficient forest management, with no aim to grow this type of forest. After carrying out clear-cuttings in the forests, coppice stands had been established in some cases were high forests were not able to regenerate.

In order to provide the best growing conditions for the main tree species (e.g. pedunculate oak, European beech, common ash, etc.), thinning was carried out in order to remove the minor tree species such as hornbeam, silver birch, trembling aspen. According to the forest management plans, these forest stands are of seed origin whereas 1 to 5 or even 6 secondary tree species, of coppice origin, are found in their species composition. This situation is typical to the forest enterprises in Poddilya Region where, during the application of thinning, the main attention was drawn to the main tree species by removing the secondary ones. In addition, a part of stands of seed origin includes a significant share of coppice trees. Unfortunately, this factor is ignored in the forest management activities.

The local population in many regions of Ukraine form the willows lines along the road or in the private gardens for producing biomass for energy. These trees are periodically cut off at a height of 1.5-2.5 meters for the development of ground vegetation and sprouting. Currently, the establishment of the industrial plantations for energy is on the stage of experimental research and is not widely implemented in forest management in Ukraine [11]. NUBiP in Ukraine and the company «Rika-biopalyvo» implemented these experimental researches. M.M. Gryshko National Botanical Garden was involved in research associated with breeding of new varieties of biological energy trees. There are no biomass energy plantations on the territories of Forests Enterprises of of Forest Resources of Ukraine

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