Ukraine

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Facts and Figures

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Definitions

(1) Coppice: Even-aged stand consisting of trees and shrubs (mainly: *Quercus* spp., *Fraxinus* spp., *Betula* spp., *Carpinus betulus, Alnus glutinosa*, occasionally *Fagus sylvatica*) that regenerate wholly or mainly vegetatively (sprout or root shoot) and are harvested in small clearcuts (0.5-1 ha) in short rotations of 30-60 years. In some cases combined with standards that have longer rotation periods.

(2) Short rotation coppice: Plantation of fast-growing trees or shrubs (mainly *Populus* spp., *Salix* spp.) with the aim to produce in several short rotation periods (5-20 years each) wood as raw material for weaving furniture and a renewable resource, mainly for energy.

(1) Переліски - невеликі здебільшого вузькі, витягнуті ділянки лісу, які межують або чергуються з окремими полянами, полями або луками, сюди також відносяться рідкостійні ліси, що з'єднують лісові масиви. Гай - невеликий за площею ліс, сформований деревами однієї породи близького віку.

(2) Підлісок - чагарники, рідше деревні породи, що не досягають висоти верхніх ярусів, не входять в основний деревний ярус і не здатні утворити деревостан у даних умовах.

Rotation Period

The rotation period varies depending on forest species. However, the most common minimum rotation periods are: 5 years *Salix*; 30-60 years *Quercus*, *Alnus, Betula, Alnus, Populus, Fagus,* and *Carpinus*.

Statistics

Coppice forests comprise about 16% of the Ukraine's 9573.9 thousand ha of forest. These are differentiated into natural coppice with rotations of up to 60 years and coppice with rotations of 2-5 years (wood energy plantations). The density of coppice plantations (up to 20 thousand trees ha^{-1}) has been established mainly with *Populus* and *Salix* species. The main products extracted from natural coppice forests are firewood, charcoal, pole wood and branches for brooms.

The coppiced trees were mainly selected for firewood (e.g. *Carpinus betulus* L., *Robinia pseudoacacia* L., *Fagus sylvatica* L., *Betula verrucosa* Ehrh., *Salix alba* L., *Salix caprea* L., *Alnus glutinosa* (L.) Gaertn., *Alnus incana* (L.) Moench, *Sorbus aucuparia* L., *Malus sylvestris* Mill., *Populus tremula* L., and *Corylus avellana* L.), while the uneven-aged standards were selected to produce timbers (e.g. *Quercus robur* L., *Quercus rubra* L., *Fraxinus excelsior* L., *Fagus sylvatica* L., *Alnus glutinosa* (L.) Gaertn.).

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Sopushynskyy I.M., Vintoniv I.S., Kharyton I.I., Ostashuk R.V. (2015): *Some Features of Firewood Qualimetry* // Scientific Bulletin of UNFU, Issue 25.1: 162-166.

Forests in Ukraine. http://dklg.kmu.gov.ua/forest/control/uk/publish/category?cat_id=32867

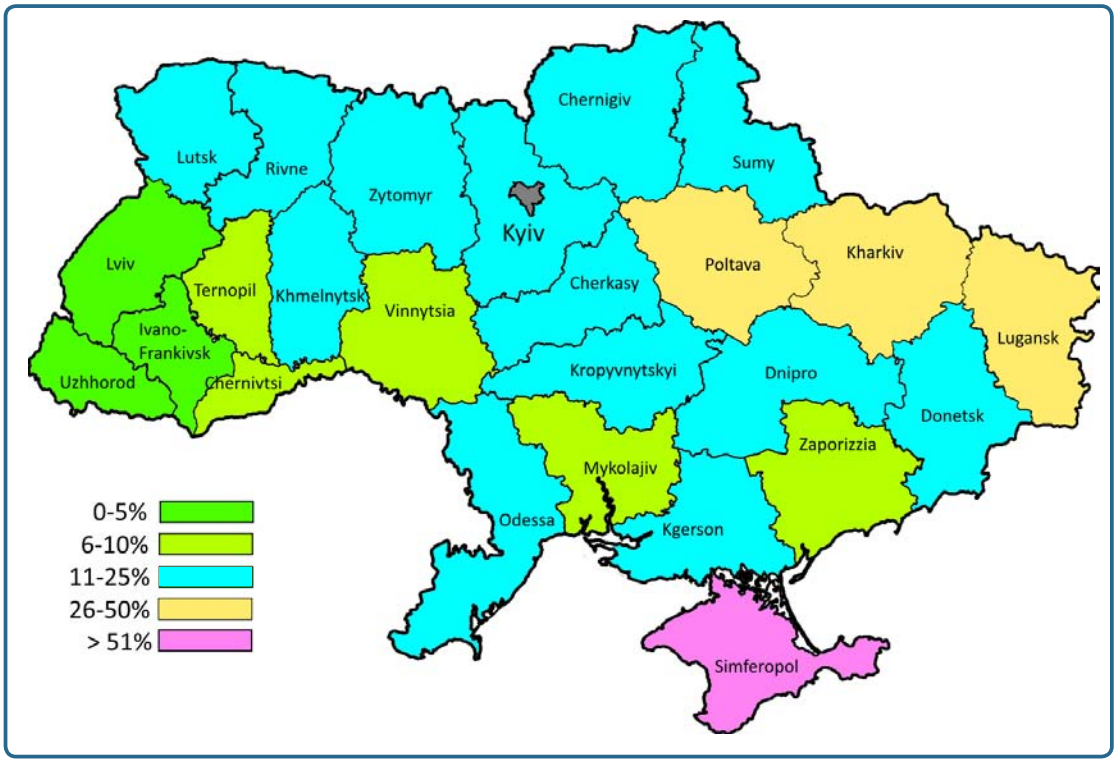
Typology

Simple coppice	Traditional natural forest regeneration method
Coppice with standards	*Populus, Alnus, Betula, Salix, Fraxinus, Quercus, Carpinus*
Pollarding	Only on roadsides and in gardens
Short rotation coppice	*Populus* spp., *Salix* spp.

Images

Map

Volodymyr Kramarets



Coppice forests in the regions of the Ukraine (in percent of the region's total forest area)

Description

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In the Ukraine, 9573.9 thousand ha are covered by forests; approximately 16% of this is coppice forest. Mixed broadleaved forests composed of 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.) and other tree species are dominant coppice tree species. They are differentiated into traditional coppice with rotations up to 60 years and wood energy plantations with rotations of 2-5 years.

The stands of coppice for wood energy were initiated in the past two decades and are mainly practiced for the economic reasons. The density (up to 20,000 trees ha^{-1}) of these coppice plantations has been established, mainly with *Populus* and *Salix* species. Short-rotation coppice is expected to expand with the predicted increase in demand for second generation biofuels.

The main products extracted from traditional coppice forests are firewood, charcoal, pole wood and branches for brooms. The coppiced trees were mainly selected for firewood (e.g. *Carpinus betulus, Robinia pseudoacacia, Fagus sylvatica, Betula verrucosa, Salix alba, Salix capraea, Alnus glutinosa, Alnus incana, Sorbus aucuparia, Malus sylvestris, Populus tremula,* and *Corylus avellana*), while the uneven-aged standards were selected to produce timbers (e.g. *Quercus robur, Quercus rubra, Fraxinus excelsior, Fagus sylvatica* and *Alnus glutinosa*).

Generally, coppice forests are located in poor rural communities. Coppice forests are often irregularly structured and disorganized.

There are some problems with coppice forests in the rural communities:

(a) the lack of forest management plans,

(b) frequent damage due to illegal cutting and random fires,

(c) over-use of coppice forests,

(d) unfavourable national energy policy,

(e) no real data on coppice in cadastres.

Traditional coppice forests in Ukraine occupy significant ecological niches that are of great social and economic value. They are mostly divided into two types regarding the site conditions and biotopes:

(1) along small rivers with temporarily wet soils

(2) on poor forest soils with low fertility and moisture content.

In both tradtional coppice forest types there is no regular forest management planning in the rural areas. The silvicultural treatments are mostly linked to the demands of the rural community for wood as raw materials and as non-wood forest products.

Figure 1. Traditional mixed broadleaved coppice forests in the Ukrainian Subcarpathians

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Forests in Ukraine. http://dklg.kmu.gov.ua/forest/control/uk/publish/category?cat_id=32867

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Forestry Regulations

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The forests of Ukraine are located in different natural zones: Polesia, forest steppe, steppe, and in mountainous regions (Carpathians and Crimea). The different topographical, edaphic and climatic conditions determine the main forest tree species distribution, their age, spatial structure and their productivity. Forests in Ukraine are not uniformly spread. The vast majority are concentrated in the Carpathians and Polesia regions. The largest forest areas are located in the oblasts (the admin divisions of the Ukraine) of Trans-Carpathia (51.1% of total land), Ivano-Frankivsk (41.0%), Rivne (36.4%), Zhytomyr (33.6%), and Volyn (31.0%). The smallest forest areas occur in eastern-southern regions: Kherson (4.1%), Mykolayiv (4.0%) and Zaporizzya (3.7%) oblasts.

Generally, Ukrainian forests are in state and communal ownerships; only 0.1% of the total forest area is found in private ownership. Forests are managed by institutions and enterprises that are **subordinated to more than 30 different Ministries and Departments**. The main forest users in Ukraine are the State Forest Resources Agency (65.2 % of the total forest area), the Ministry of Agrarian Policy and Food of Ukraine (5.5%), and the Ministry of Ecology and Natural Resources of Ukraine (1.6%). Communal forests (within local governments) comprise 12.5% of the forest area.

Data on State forests

The following data all refers to forests of the State Forestry Agency of the Ukraine:

Forests in Ukraine have long been exploited and still undergo intensive economic impacts. As a result, forest plantations dominate with 51.5% of the total forest area, while natural, seed-originating forests occupy 32.0% and coppice forests cover 16.5% of the forest area. The largest areas of coppice forests (155,800 ha, 67.8% of the total area of such forests) are found in the Autonomous Republic of Crimea. Coppice forests are also distributed in the Zhytomyr (111,600 ha), Volyn (93,500 ha), Kharkiv (92,300) and Rivne (90,200 ha) regions.

The eastern part of Ukraine (Luhansk, Kharkiv and Poltava regions) has the greatest distribution of coppice forests - in each of those oblasts more than 30% of the total forest area is of coppice origin. Compared with the western part of the country, there are small parts of coppice in Lviv, Ivano-Frankivsk and Trans-Carpathian regions, where coppice forests occupy only 3.8%, 3.7% and 2.0% respectively of the total forest area. Mature and over-mature coppice stands dominate, occupying 47.2% of all coppices, compared with only 8.3% in young categories.

Coppice forests in Ukraine developed without any clear intention to grow this type of forest. After World War II, part of the felled area remained as coppice, providing a fairly rapid supply of wood for heating and timber. In order to provide the best growing conditions for the main tree species (e.g. pedunculate oak, European beech, common ash, etc.), thinning of minor tree species such as hornbeam, silver birch and aspen was carried out. According to forest management plans, these stands are of seed origin, whereas they can contain up to 5-6 secondary tree species of coppice origin. This situation is typical in the forest enterprises of Poddilya and Lisostep (Tkach and Golovach 2009). Thinning favoured the main tree species, removing the secondary ones. Although a portion of these stands include a significant amount of coppice, unfortunately this factor is ignored in forest management activities.

Recently, it has been shown that the cultivation of coppice tree stands can have a number of advantages. In studies conducted in the Poltava region, comparisons of oak coppice forests with artificially planted oaks (Bojko 2006) indicated that: the time period of forest formation is decreased in coppices; a more complex structure develops than in oak forest plantations; coppices have higher productivity and a greater contribution to biodiversity conservation; and they reduce erosion and promote environment-specific functions (water and soil protection). Mature coppice oaks possessed a larger stock and a greater yield of small and medium-size wood than planted oaks. At the same time, the condition of coppice forests was often poor and a large share was affected by root and stem rot pathogens (Tkach 1999; Ustskiy and Bugayov 2014).

Usage of coppice stands for firewood production has a long tradition in Ukraine. Various species of willows were pollarded, for example, along with smaller amounts of poplar or other tree species. These willows were regenerated vegetatively using cut branch lengths, which quickly rooted up, on rich, wet soils along rivers or ponds. These were then periodically cut at 1.5-2.5 m above ground to aid the development of brushwood and sprouting. After several years, the willow branches were cut and used as firewood. Even nowadays, in many regions of the Ukraine local populations plant lines of willows along roads or in private gardens for firewood and heating, especially in the lowlands of Ukraine and in the Pre-Carpathian and Carpathian regions with a high forest cover. After the World War II, considerable attention was also paid to the selection of fast-growing poplar plantations (Shevchenko 1958), but this tree species is rarely used. Currently, biomass plantations to generate industrial energy are the subject of experimental research, but there are none on the territories of Forests Enterprises of the State Forest Resources Agency of Ukraine. Nevertheless, both the natural and economic conditions do allow fast-growing plantations for energy purposes to be established (Fuchylo et al. 2007).

Due to the problems concerning gas supplies from Russia and the war in the eastern part of Ukraine, where the coal mines are concentrated, our country faces the acute problem of finding alternative sources of energy. Thus, the **National Action Plan for Renewable Energy 2020**, approved by the Cabinet of Ministers of Ukraine on 01.10.2014, includes measures to promote bio-energy (National Action Plan 2014). The most realistic of these is the production of biomass for heating of private households, and for public, industrial and commercial consumers. There is also the prospect that biomass for energy production might be grown on an industrial scale. Private companies (Rika Biopalyvo, Eco-Energy) have made a commercial offer to establish energy plantations (Rakhmetov 2017), and the agro-energy company "SalixEnergy" is planning the cultivation of willow biomass for thermal and electric energy. On 1.05.2016, this company established 1,700 ha of energy plantations in the western part of Ukraine (Gnap 2016).

The growing and cultivation of energy crops requires support from the state and legislative regulators. The **Law of Ukraine "On Amending Certain Laws of Ukraine Concerning Ensuring Competitive Conditions for the Production of Electric Power from Alternative Energy Sources"** was adopted (04.06.2015) for the promotion of renewable energy, in particular:

- The "green tariff" for electricity generated from alternative sources (including wood) is approaching average world prices;
- If components of Ukrainian production are used to design and construct alternative energy sources, the remuneration is set as an allowance for the "green tariff";

- Stimulation of bioenergy is provided by setting the "green tariff" rate for electricity generated from alternative energy sources (including biomass).

The **Law of Ukraine "On Amendments to the Law of Ukraine "About Heat Supply" on Stimulation of the Production of Thermal Energy from Alternative Energy Sources"** (21.03.2017) promotes the production of energy for heating from alternative sources at local level. Moreover, domestic and foreign investments are guaranteed on the return of their investment, and can adjust the bioenergy tariff depending on the current gas tariff.

The tariffs for biological energy produced from alternative sources, including renewable resources (wood) for the local population and the state institutions, are set at 90% of the current tariff of heat produced from gas. Licensing activities for producing heat energy from alternative sources and setting tariffs is done at the local level, which allows for varying conditions in different regions within Ukraine and aims to stimulate small and medium businesses. In the new version of the **Law of Ukraine "About the Electricity Market"** (13.04.2017) considerable attention is paid to stimulating the production of electricity from renewable and alternative energy sources.

To summarize, the coppice forests of Ukraine result from a lack of effective forest management, especially after the World War II. However, there is a growing interest in the cultivation of fast-growing coppice tree species in plantations, which could become an important source of renewable energy in modern Ukraine. In addition, as shown above, domestic and foreign investors are given guarantees on returns from their investments in producing thermal energy from biomass, which in the future will further stimulate the cultivation of fast-growing coppice plantations.

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